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CHAPTERS

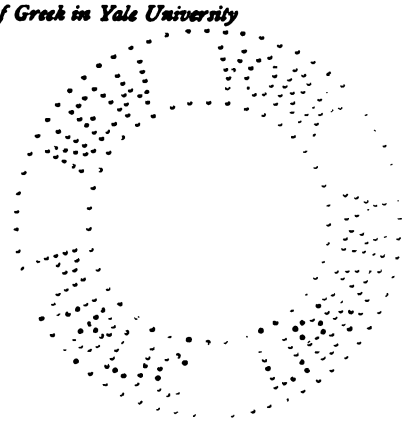
ON

GREEK METRIC

BY

THOMAS DWIGHT GOODELL

Professor of Greek in Yale University



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CONTENTS

		Page
I.	Scope and Method	1
II.	Rhythmicus or Metricus?	6
III.	Rhythm and Language	58
IV.	Rhythm in Greek	99
V.	Foot, Ictus, "Cyclic" Feet	131
VI.	Compound and Mixed Meters	184
	INDEX	247

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CHAPTERS ON GREEK METRIC

I

SCOPE AND METHOD

It is a mark of a living and growing civilization, in contrast with a stagnant or declining one, that in the former men are ever renewing the critical examination of the fundamental notions. This is true also of every separate art or science. From each new vantage ground attained the question is put anew about one principle and belief after another, supposed to be firmly established: But after all, is it well-founded, is it true, is it fundamental? To some people this is disturbing; they fancy that the very framework is dissolving and foundations disappearing. Yet all the while out of the confusion of decay, in which the outworn vanishes, there is growing up a new and sounder life. The questioning attitude toward the old is an essential condition of such growth; all of the old that is worth preserving finds its place in a newly organized and higher type.

The science of classical philology is in every branch of it undergoing that experience. Greek metric is a peculiarly difficult branch, because the forms of verse are nothing except as spoken, and the ancients can no longer speak their verses to us; there is always an unknown quantity in our reconstruction of the series of sounds which their lines represent. True, a considerable degree of uncertainty or of known error in details is

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consistent with substantial truth to the more important facts of rhythmical movement in the poetry of a past age. Our pronunciation of Shakspere's lines would have sounded barbarous to him; yet we are certain that with few exceptions we reproduce his rhythm with substantial truth, although we have changed the quality of the vowels. Yet where the basis of rhythmical structure is so different as in ancient Greek when compared with modern English or German, it is always possible that the unknown element affects the very essence. Widely different views have been held, and are now held, about the nature of some common rhythms of Greek verse, controversies are rife and lusty. The onlooker may be pardoned for believing that all is uncertain and knowledge unattainable. Yet on the whole the past century has seen substantial progress toward the recovery of the ancient meters. It is not my purpose to recount the history of this progress, or to discuss with anything like completeness the opinions now current; but rather to offer, if possible, a modest contribution toward farther advance. The following chapters will be devoted primarily to discussion of fundamental principles. But they will include also applications of those principles to particular forms of verse, in sufficient number to keep the discussion as concrete as possible, and at the same time leave no doubt as to my notion of the practical bearing of the conclusions here defended.

Such a discussion, to be of any use, must of course rest upon adequate acquaintance with what others have done; but it need not necessarily be accompanied at every step by detailed refutation, or even enumeration, of views defended by others, whether at variance or in more or less close agreement with those of the author. The reader will meet here only the minimum of refer-

ence to previous writers on the subject. To avoid misunderstanding, therefore, a word of explanation is called for.

It should be said at the outset that my motive for such omission of references is not in the least a desire to conceal my dependence on predecessors or to detract from their merits. Closer study of so thorny a subject tends rather to raise one's estimate of earlier work, in some cases even of those with whom one can least agree. But in the first place every new presentation must stand or fall on its own merits; and those most competent to judge it, whose appraisal will ultimately determine its place, do not need to be informed either where I have learned from others or whose view it is that I am endeavoring to replace with a sounder one. And again, the subject appears to me peculiarly difficult to present with sufficient clearness to avert misunderstanding. The constant citation of others' views, whether to controvert them in toto or to explain a partial failure to agree with them, or even to state that I have followed them, would have added much to the bulk of these chapters, something to their obscurity, and nothing to their real value. There are then three classes of cases, running together more or less, in which I shall not always feel bound to give precise references. First, the volumes of Rossbach and Westphal, Christ's Metrik, and the section by Gleditsch in Müller's Handbuch are assumed to be well known; they must in great part furnish the basis for any new-comer. Not the slightest originality can be supposed to be claimed for anything that is contained in any of these. This broad acknowledgment of my great indebtedness to them will I hope be deemed sufficient. Secondly, my presentation will sometimes closely parallel that of the scholars just named

or of some one else, but with more or less deviation on essential points. While no credit is claimed where such repetition occurs, omission of such parts repeated from others would leave my page obscure, particularly to one who is not already quite at home in this field. Simply to make my own conception plain at the points where it diverges, it will not infrequently be necessary, then, to go over again in detail some topic or portion of a topic that another has already clearly elucidated. Comparison will generally show, I trust, that the deviations justify the repetition. But constant reference to the points of likeness and of divergence, as was just said, would greatly lengthen the argument and introduce another and most annoying source of obscurity. Naturally the more familiar the reader is with metrical studies the more of such repetition will he find. Thirdly, in some cases of fundamental disagreement, which will at once be recognized as such, the polemic tone will on principle be avoided as much as possible, even to the omission of names of scholars who are deservedly honored in the whole philological world.

Considerable space will be given to quotations from our ancient sources. To judge from my own experience, nearly all readers will be grateful for this. Even if one has the books at hand, one grudges the time required for looking out the passages. Care will be taken also to cite the original with sufficient fulness. Nothing more quickly destroys confidence in a writer's singleness of aim than to discover that the full context materially changes the aspect of a citation on which his argument depends. It may be only his judgment that is at fault, not his sincerity; but the effect on our estimate of his reasoning is the same. It is better to waste a little space by citing at unnecessary length than to commit

even unintentionally the mistake of garbling. It is good policy as well as a duty to put before the reader every facility for testing the argument for himself at every step. Similar considerations render some repetition of my own argument unavoidable, as the same topic or the same statement of an ancient author may require examination from more than one side. The whole subject has been so obscured by misunderstanding that whoever writes upon it at all is bound to do his utmost for perspicuity; the repetition involved need not lead to diffuseness.

Finally let no one imagine from what has preceded that my program includes anything so large as revolution or re-creation of this branch of philological science. To not a few my conclusions will appear antiquated rather than specially new. The whole aim of these chapters will be attained, if by steadier adherence to certain sound principles, that have been too little observed, our conception of Greek verse-forms is brought a little nearer to the reality. It will be my constant endeavor to see things as they are, to avoid polemic so far as possible, and to keep an open mind.

II

RHYTHMICUS OR METRICUS?

In our ancient sources on metric there is frequent mention of certain differences of opinion between the *ῥυθμικοί* (rhythmici) or *μουσικοί* (musici) and the *μετρικοί* (metrici) or *γραμματικοί* (grammatici). These differences are well known and have been often discussed; yet it will be worth while to examine again the more important passages referring to them. The exact chronological order, even if this could be always made out, is of little consequence for our present purpose. We may take first a brief and very clear one from the scholia to Hephaistion.

Ἰστέον δὲ ὅτι ἄλλως λαμβάνουσι τοὺς χρόνους οἱ μετρικοὶ ἤγουν οἱ γραμματικοί, καὶ ἄλλως οἱ ῥυθμικοί. οἱ γραμματικοὶ ἐκεῖνον μακρὸν χρόνον ἐπίστανται τὸν ἔχοντα δύο χρόνους, καὶ οὐ καταγίνονται εἰς μεῖζόν τι· οἱ δὲ ῥυθμικοὶ λέγουσι τόδε εἶναι μακρότερον τοῦδε, φάσκοντες τὴν μὲν τῶν συλλαβῶν εἶναι δύο ἡμίσεως χρόνων τὴν δὲ τριῶν τὴν δὲ πλειόνων· οἷον τὴν ὡς οἱ γραμματικοὶ λέγουσι δύο χρόνων εἶναι, οἱ δὲ ῥυθμικοὶ δύο ἡμίσεως· δύο μὲν τοῦ ω μακροῦ ἡμίχρονον δὲ τὸ σ· πᾶν γὰρ σύμφωνον λέγεται ἔχειν ἡμιχρόνιον. (P. 93 Westphal, p. 16 Hoerschelmann.)

At much greater length Marius Victorinus (p. 39 f. K.[1]) remarks to the same effect on the 'non parva dissensio

[1] For convenience this treatise will be cited in the usual way, by Keil's title, in Gram. Lat. VI.

inter metricos et musicos propter spatia temporum quae syllabis comprehenduntur.' Especially significant is the sentence: 'Musici, qui temporum arbitrio syllabas committunt, in rhythmicis modulationibus aut lyricis cantionibus per circuitum longius extentae pronuntiationis tam longis longiores quam rursus per correptionem breviores brevibus proferunt.' As examples, however, he gives only the isolated words Thersandrus and *ἀμφιεσμένος*, in each of which the first syllable is long by position, but is made still longer by changing the short vowel to an *η*. The author sums up by proposing to leave this 'scrupulositas' to the musici and rhythmici; 'nam quod ad nos attinet, notemus plerasque syllabas ratione pares esse, spatio autem seu sono impares, ut dicimus omnes Germanos longos esse, quamvis non sint omnes eiusdem staturae: sic dicemus etiam has syllabas in genere esse, non in spatio, longarum seu brevium syllabarum.'

The earliest in date of these references is in Dionysios Hal., as follows:

Ὁμολογεῖται δὴ βραχεῖαν εἶναι συλλαβὴν ἣν ποιεῖ φωνῆεν βραχὺ τὸ ο, ᾧ λέγεται ὁδός. ταύτῃ προστεθήτω ἓν γράμμα τῶν ἡμιφώνων τὸ ρ καὶ γενέσθω Ῥόδος· μένει μὲν ἔτι βραχεῖα ἡ συλλαβὴ, πλὴν οὐχ ὁμοίως, ἀλλ' ἔξει τινὰ παραλλαγὴν ἀκαρῆ παρὰ τὴν προτέραν. ἔτι προστεθήτω ταύτῃ τῶν ἀφώνων γραμμάτων τὸ τ, καὶ γενέσθω τρόπος· μείζων αὕτη τῶν προτέρων ἔσται συλλαβῶν, καὶ ἔτι βραχεῖα μένει. τρίτον γ' ἔτι γράμμα τῇ αὐτῇ συλλαβῇ προστεθήτω τὸ σ καὶ γενέσθω στρόφος· τρισὶν αὕτη προσθήκαις ἀκουσταῖς μακροτέρα γενήσεται τῆς βραχυτάτης, μένουσα ἔτι βραχεῖα. οὐκοῦν τέσσαρες αὗται βραχείας συλλαβῆς διαφοραὶ, τὴν ἀνάλογον ἔχουσαι αἴσθησιν τῇ παραλλαγῆς μέτρον. ὁ δὲ αὐτὸς λόγος καὶ ἐπὶ τῆς μακρᾶς. ἡ γὰρ ἐκ τοῦ η γινομένη συλλαβὴ, μακρὰ τὴν φύσιν οὖσα, τεσσάρων γραμμάτων προσθήκαις παραυξηθεῖσα, τριῶν

προταττομένων ἑνὸς δὲ ὑποταττομένων, καθ' ἣν λέγεται σπλὴν, μείζων ἂν δήπου λέγοιτο εἶναι τῆς προτέρας ἐκείνης τῆς μονογραμμάτου· μειουμένη δ' αὖ καθ' ἓν ἕκαστον τῶν προστεθέντων γραμμάτων, τὰς ἐπὶ τοὔλαττον παραλλαγὰς αἰσθητὰς ἂν ἔχοι. αἰτία δὲ ἥτις ἐστὶ τοῦ μήτε τὰς μακρὰς ἐκβαίνειν τὴν ἑαυτῶν φύσιν, μέχρι γραμμάτων ἑπτὰ μηκυνομένας, μήτε τὰς βραχείας, εἰς ἓν ἀπὸ πολλῶν γραμμάτων συστελλομένας, ἐκπίπτειν τῆς βραχύτητος, ἀλλὰ κἀκείνας ἐν διπλασίῳ λόγῳ θεωρεῖσθαι τῶν βραχειῶν, καὶ ταύτας ἐν ἡμίσει τῶν μακρῶν, οὐκ ἀναγκαῖον ἐν τῷ παρόντι σκοπεῖν. ἀρκεῖ γὰρ, ὅσον εἰς τὴν παροῦσαν ὑπόθεσιν ἥρμοττεν, εἰρῆσθαι ὅτι διαλλάττει καὶ βραχεῖα συλλαβὴ βραχείας καὶ μακρὰ μακρᾶς, καὶ οὔτε τὴν αὐτὴν ἔχει δύναμιν, οὔτε ἐν λόγοις ψιλοῖς οὐτ' ἐν ποιήμασιν ἢ μέλεσι διὰ ῥυθμῶν ἢ μέτρων κατασκευαζομένοις, πᾶσα βραχεῖα καὶ πᾶσα μακρά. (De Comp. Verb. 15, p. 178 ff. Schaefer.)

The same doctrine of the ῥυθμικοί appears in Aristides Quintilianus.

Τούτων οὖν οὕτως ἐχόντων δέδεικται τὰ μεγέθη τῶν στοιχείων τοῖς διαστήμασιν ἰσάριθμα τοῦ τόνου· τὸ μὲν γὰρ ἐλάχιστον αὐτῶν τοῦ μεγίστου τεταρτημόριόν ἐστιν, ὡς ἡ δίεσις τοῦ τόνου, τὸ δὲ μέσον ἥμισυ μὲν τοῦ μείζονος, διπλάσιον δὲ τοῦ ἐλάσσονος· τῆς μὲν γὰρ μακρᾶς ἡμίσειά ἐστι βραχεῖα, τῆς δὲ βραχείας ἁπλοῦν σύμφωνον· δῆλον δὲ ἐκ τοῦ τὴν βραχεῖαν ἢ διπλοῦ συμφώνου παρατεθέντος ἢ ἑνὸς φωνήεντος γενέσθαι μακράν. (I 21, p. 45 Mb.)

To sum up, then, we find this difference affirmed between the two schools. The metrici considered the long syllable as always twice the length of the short; whatever variation from this ratio the varying constitution of syllables produced was treated as too slight to affect the general flow of verse. The rhythmici, on the other hand, held that long syllables differed greatly from each other in quantity and that short syllables differed

from each other in some degree, apart from variations in tempo. The doctrine of *ἀλογία* or irrationality, whereby some syllables were longer or shorter by a small undefined amount than the complete long, was associated by some with this theory, as in a passage of Dionysios Hal. which we must examine more fully later. (See p. 169.) Some, at least, affirmed also that a single consonant required half the time of a short vowel, and that two consonants or a double consonant required the same time as a short vowel; these writers accordingly set up a scale of measurement for syllables, simply counting the number of time-units required, on this theory, by the constituent vowels and consonants.

We may now add another passage from Aristides Q.

Οἱ μὲν οὖν συμπλέκοντες τῇ μετρικῇ θεωρίᾳ τὴν περὶ ῥυθμῶν τοιαύτην τινὰ πεποίηνται τὴν τεχνολογίαν· οἱ δὲ χωρίζοντες ἑτέρως ποιοῦσι. (I 18, p. 40 Mb.)

The two schools are here distinctly recognized, along with a group who combined in their presentation the doctrines of both; but a careful examination of the context is necessary before one sees clearly who the *συμπλέκοντες* and the *χωρίζοντες* are. The passage forms part of the section on *ῥυθμική*, which is introduced by the words, at the end of chapter 12 (p. 31 Mb.), *μεταβῶμεν δὲ λοιπὸν ἐπὶ τὴν ῥυθμικὴν θεωρίαν.* In chapter 13 the nature of rhythm is considered; then in order come the topics *πρῶτος χρόνος*, *σύνθετος χρόνος*, *πούς*, *γένη ῥυθμικά*, then the *ῥυθμοὶ σύνθετοι*, *ἀσύνθετοι*, and *μικτοί*. In chapters 15 and 16 are taken up the *δακτυλικὸν γένος*, the *ἰαμβικόν*, the *παιωνικόν*. In 17 we are told that several kinds of rhythm arise from the mingling of these *γένη*, — two *δοχμιακά*, and the so-called *προσοδιακοί*. Then are described two *ἄλογοι χορεῖοι*, the *ἰαμβοειδής* and the *τροχαιοειδής*. Also, he

adds, there are other ῥυθμοὶ μικτοί, six in number, which he names and describes, — the κρητικός (– ∪ – ∪), the δάκτυλος κατ' ἴαμβον (∪ – ∪ –), the δάκτυλος κατὰ βακχεῖον τὸν ἀπὸ τροχαίου (– ∪ ∪ –), the δάκτυλος κατὰ βακχεῖον τὸν ἀπὸ ἰάμβου (∪ – – ∪), the δάκτυλος κατὰ χορεῖον τὸν ἰαμβοειδῆ and the δάκτυλος κατὰ χορεῖον τὸν τροχαιοειδῆ. Next follows (after a remark on the names of the last six feet) the passage quoted above: "Such is the system constructed by those who combine rhythmical principles with their doctrine of metric; but those who separate these proceed otherwise. Namely," etc.

The summary which follows is not easy to understand in detail, but is clearly "rhythmical," a more or less remote echo of Aristoxenos, 302 Mor. It introduces the κενοὶ χρόνοι, or rests, deals with rhythmical ratios, and contains no suggestion of the purely "metrical" doctrine. This agrees with the interpretation just given for the passage quoted. Chapters 16 and 17 contain much that is "rhythmical" in character (as the irrational feet), mingled with not a little that is distinctive of the μετρικοί. The word order of the Greek gives to μετρικῇ the greater prominence. This consideration is of some consequence to the interpretation; descending stress is the rule in Greek, as the ascending is in English and French. Οἱ συμπλέκοντες are primarily metrici, but they endeavor to combine more or less of rhythmical doctrine with that of the pure metrici; οἱ χωρίζοντες are rhythmici.

This passage of Aristides has been dwelt on at greater length because it indicates the general attitude of the author. His treatise bears the title περὶ μουσικῆς and includes an outline of musical theory; one therefore naturally assumes that in his treatment of verse he should be counted as μουσικός rather than μετρικός. In

fact however he is an eclectic, who drew from various sources, including some of the oldest and best; but every statement of his on metric must be examined critically by itself before it can be accepted as anything better than that of a late *μετρικός*.[1]

None of the preceding extracts gives a name or enables us to identify any of the authors alluded to as rhythmici. But Aristoxenos is often cited as *ὁ μουσικός*, and since Westphal's labors no one doubts the prominence of Aristoxenos as the founder and leader of that school, or his fundamental importance in the study of Greek rhythmic and metric. And for us he stands alone. His followers appear to have added nothing of value to his treatment of the subject; their errors can no longer be assigned with certainty to specific names. Now the special merit of Aristoxenos in the treatment of metric is that he clearly saw and clearly set forth the relations of rhythm in verse to other forms of rhythm. Speech was to him merely one of many *ῥυθμιζόμενα*. The principles of rhythmic, as he conceived it, are the same in instrumental music, in the dance, in poetry; *μετρική*, *ὀρχηστική*, and *μουσική* in the narrower sense, were to him parallel; his *ῥυθμικὰ στοιχεῖα* kept all equally in view, as our fragments of that work clearly show.

However, the precise doctrines attributed in our citations to the *ῥυθμικοί* do not appear in Aristoxenos as we have him. The doctrine of *ἀλογία*, of *συλλαβαὶ ἄλογοι* and *πόδες ἄλογοι*, he has indeed; but in his lucid and rather detailed explanation of the matter there is no hint of an application of it to ordinary dactylic hexam-

[1] Cf. Susemihl, Gesch. d. gr. Lit. in d. Al. Zeit, II p. 223 ff., and v. Jan on Arist. Q. in Pauly-Wissowa, and T. Reinach in Rev. des Et. gr., 1899, vol. 12, p. 422.

eters or to any variety of anapæstic verse. In a later chapter we shall return to this topic; for the present it is enough to note the absence from our incomplete Aristoxenos of that particular kind of *ἄλογος μακρὰ βραχυτέρα τῆς τελείας* which we are told the *ῥυθμικοί* found in some Homeric hexameters and in certain anapæsts. Equally unknown to our Aristoxenos is the theory of constant and exact time ratios between vowels and consonants. And for the two reasons it is difficult to believe that it was accepted by the great *ῥυθμικός*. In the first place, his principle of *ἀλογία* (which we shall see was applied both to verse that was spoken and to verse that was sung) was an impossibility, unless he recognized a considerable degree of variability in the lengths of vowels and consonants. A long vowel plus two consonants or a double consonant made, according to the *ῥυθμικοί* in question, a syllable thrice as long as a syllable of one short vowel only. Yet it is certain that Aristoxenos regarded as irrational, that is, as having something less than twice the length of a single short vowel, many such syllables. And secondly, the doctrine is so self-contradictory in practice that no one, not even the inventor of it, could hold to it in concrete cases of connected verse. For example, in the line

Ἰλιόθεν με φέρων ἄνεμος Κικόνεσσι πέλασσεν,

in which we are assured the *ῥυθμικοί* regarded the long syllables as irrational, not quite so long as the *τελεία μακρά*, the syllable *-ρων* would by this theory be three (possibly two and a half) times the length of a short syllable, and every syllable containing a short vowel and one consonant would exceed the proper length of a short syllable. Evidently this doctrine would destroy all rhythm in poetry as the Greeks wrote it. The notion

can have been nothing more than a bit of abstract theory, not even supposed to have any practical application in verse. The passage from Aristides Q. (I, 21, above, p. 8) probably indicates the origin of the notion. From the fact that a short vowel makes a long syllable when followed either by a double consonant (or two consonants) or by a single vowel (making a diphthong) some one drew what seemed to him the obvious inference, namely, that a single consonant demands half the time of a short vowel. The analogy of this scale of quantities with the ratio existing between the δίεσις or quarter tone, the semitone, and the whole tone in the musical scale might naturally, to a ῥυθμικός of this type, appear like a rather pretty support for the doctrine. But of any serious application of the doctrine to any Greek verse there could be no question. That the doctrine is still gravely cited occasionally, and that Brücke supposed that he had demonstrated the truth of it for modern German, does not strengthen it in the least. It is easily made obvious to the ear, and has been demonstrated repeatedly (as will appear later) that consonants and vowels alike are very elastic as regards the time of pronunciation. We have no reason to doubt that this was true, in some degree at least, in ancient Greek. Certainly, if it were otherwise, a reasonable — not to say exact — observance of time ratios between the syllables in ancient Greek song would have been impossible.

This doctrine, then, probably also the peculiar application of the principle of ἀλογία, though quoted from *οἱ ῥυθμικοί*, had no place in the system of the greatest of the ῥυθμικοί, Aristoxenos. Later writers, basing upon him, elaborated his theory and added these with other excrescences. One principle, however, all the ῥυθμικοί retained in common, namely, that long syllables were not

all and always twice the length of short syllables. In Aristoxenos we can see that this principle stood in rational connection with other sound principles, all centering in his recognition of the fact that metric was properly a branch of rhythmic, that rhythm in language is identical in nature with rhythm in many other forms of physical movement, and particularly with rhythm in music and the dance.

On the other hand the metrici, disregarding those relations of language rhythm, made no distinction between long syllables. To them short syllables were all practically equal, and a long syllable always practically twice as long as a short syllable. If they did not deny entirely the existence of any difference between long syllables, they considered those differences too slight to make it needful to take them into account in describing verse forms.

It is well known that most of the writings on metric that have come down to us belong to this school, and contain only occasional recognition of the other view. That fact is itself noteworthy. True, it may mean nothing more than that Byzantine and Italian students of the classics in the Middle Ages found the metrici more intelligible and more useful for what they desired, and hence neglected the rhythmici. The ancient orchestic had perished and no longer interested the medieval student. Ancient music had undergone or was undergoing transformation; and though special treatises on music were still current, the rhythm of ancient music was so closely connected with that of poetry, that special musical handbooks appear to have said little about that side of the subject. It was therefore natural that handbooks which treated the rhythm of verse without reference to the other rhythmical arts should be thought sufficient, and

should alone be propagated in the schools. Anyway such purely metrical handbooks were the ones in common use in both the Byzantine and the Latin schools, and have survived in considerable bulk, while of the *ῥυθμικὰ στοιχεῖα* of Aristoxenos only fragments, comparatively small, are extant.

But there is a farther significance in this survival of the metrici. The "metrical" view of verse rhythms not only was the prevalent one in later times; it was widely prevalent in the classical period also, and was older than the "rhythmical." This has been remarked by others, as by Kawczynski (Essai sur l'origine et l'histoire des rythmes, p. 81), by J. Caesar (Grundzüge der gr. Rhythmik, p. 33), and by Susemihl (Gesch. der gr. Lit. in der Alexandrinerzeit, II, p. 218 ff.). Susemihl reminds us that the use of the syllable as a unit of measurement by *οἱ παλαιοὶ ῥυθμικοί*, which usage Aristoxenos vigorously opposed, is itself a distinct indication of the "metrical" standpoint. More recently G. Schultz (Hermes, vol. 35, 1900, p. 308 ff.) has shown that the name *τὸ πεντάμετρον* for the *ἐλεγεῖον*, implying certainly something of the same view, was already current in the early part of the fourth century. Some other things point the same way.

Aristides Q. at the close of I 19 (p. 43 Mb.) proposes, having finished his account of rhythmic, to take up briefly the subject of metric; which he proceeds to do. The following chapter begins:

Ἀρχὴ μὲν οὖν ἡ τῆς μετρικῆς ὁ περὶ στοιχείων λόγος, εἶθ' ὁ περὶ συλλαβῶν, εἶθ' ὁ περὶ ποδῶν, εἶθ' οὕτως ὁ περὶ τῶν μέτρων, τελευταῖος δὲ ὁ περὶ ποιήματος, πρὸς ἔνδειξιν τοῦ σκοποῦ τῆς μετρικῆς παρατιθέμενος.

These topics he then considers in the order mentioned. These are the topics and the order familiar to us in all

the metrical handbooks that we have in sufficiently complete form to enable us to judge. Terentianus Maurus stops short of the last topic, but treats the others at length; Marius Vict., Bk. I, varies the order only by inserting transitional paragraphs, like those *de arsi et thesi* and *de rhythmo* (p. 40 ff. Keil), which have a "rhythmical" tinge. Hephaistion's handbook omits the first topic, on the letters, and is justified for so doing by Longinus in his *προλεγόμενα* (p. 92 W., p. 4 Hoerschelmann) by the remark:

Ἐν δὲ τοῖς μετρικοῖς εἰδέναι δεῖ ὅτε πᾶσα βραχεῖα ἴση καὶ πᾶσα μακρὰ ἴση. καθόλου γὰρ αἱ μέν εἰσι δίχρονοι, αἱ δὲ μονόχρονοι. ἐντεῦθεν τὸν μὲν δάκτυλον καλοῦμεν τετράχρονον, τὸν δὲ πυρρίχιον δίχρονον, οὐ πολυπραγμονοῦντες τῆς ποιητικῆς λέξεως ἢ συλλαβῆς τὰ στοιχεῖα, οὐδὲ ἐν ποσότητι καταμετροῦντες τοὺς χρόνους, ἀλλ' ἐν δυνάμει τῆς ποσότητος.

The thought is: Since in metric we regard all long syllables as equal and all short syllables as equal, we need not trouble ourselves to measure the precise (perhaps slightly varying) length nor discuss the individual sounds that make up the syllables in poetry. Except for this omission, Hephaistion follows the scheme precisely.

We find now that these same topics and this same order — at least as regards the first two — go back, as a traditional part of works on metric, to a considerably earlier date than Aristoxenos. In the Poetics, 20, Aristotle says: *Τῆς δὲ λέξεως ἁπάσης τάδ' ἐστὶ τὰ μέρη, στοιχεῖον, συλλαβή, σύνδεσμος, ὄνομα, ῥῆμα, ἄρθρον, πτῶσις, λόγος.* He then discusses briefly the *στοιχεῖον*, which he describes as *φωνὴ ἀδιαίρετος*, and certain classes of *στοιχεῖα*, namely *φωνῆεν, ἡμίφωνον, ἄφωνον*, which he defines and exemplifies. And these differ, he adds, *σχήμασί τε*

τοῦ στόματος καὶ τόποις καὶ δασύτητι καὶ ψιλότητι καὶ μήκει καὶ βραχύτητι, ἔτι δὲ ὀξύτητι καὶ βαρύτητι καὶ τῷ μέσῳ· περὶ ὧν καθ' ἕκαστον ἐν τοῖς μετρικοῖς προσήκει θεωρεῖν. Then follows a single sentence on the syllable, with the addition: *ἀλλὰ καὶ τούτων θεωρῆσαι τὰς διαφορὰς τῆς μετρικῆς ἐστιν.*

With this Vahlen compares De Part. Anim. 2, 16. 660 a 2:

Ὁ λόγος ὁ διὰ τῆς φωνῆς ἐκ τῶν γραμμάτων σύγκειται, τῆς δὲ γλώττης μὴ τοιαύτης οὔσης μηδὲ τῶν χειλῶν ὑγρῶν οὐκ ἂν ἦν φθέγγεσθαι τὰ πλεῖστα τῶν γραμμάτων· τὰ μὲν γὰρ τῆς γλώττης εἰσὶ προσβολαί, τὰ δὲ συμβολαὶ τῶν χειλῶν. ποίας δὲ ταῦτα καὶ πόσας καὶ τίνας ἔχει διαφοράς, δεῖ πυνθάνεσθαι παρὰ τῶν μετρικῶν.

Further, Plato (Krat. 424 b c) has the following:

Ἀλλὰ τίς ἂν εἴη ὁ τρόπος τῆς διαιρέσεως, ὅθεν ἄρχεται μιμεῖσθαι ὁ μιμούμενος; ἆρα οὐκ ἐπείπερ συλλαβαῖς τε καὶ γράμμασιν ἡ μίμησις τυγχάνει οὖσα τῆς οὐσίας, ὀρθότατόν ἐστι διελέσθαι τὰ στοιχεῖα πρῶτον, ὥσπερ οἱ ἐπιχειροῦντες τοῖς ῥυθμοῖς τῶν στοιχείων πρῶτον τὰς δυνάμεις διείλοντο, ἔπειτα τῶν συλλαβῶν καὶ οὕτως ἤδη ἔρχονται ἐπὶ τοὺς ῥυθμοὺς σκεψόμενοι, πρότερον δ' οὔ; ἆρ' οὖν καὶ ἡμᾶς οὕτω δεῖ πρῶτον μὲν τὰ φωνήεντα διελέσθαι, ἔπειτα τῶν ἑτέρων κατὰ εἴδη τά τε ἄφωνα καὶ ἄφθογγα — οὑτωσὶ γάρ που λέγουσιν οἱ δεινοὶ περὶ τούτων — καὶ τὰ αὖ φωνήεντα μὲν οὔ, οὐ μέντοι γε ἄφθογγα; καὶ αὐτῶν τῶν φωνηέντων ὅσα διάφορα εἴδη ἔχει ἀλλήλων.

From these passages two inferences can be drawn without question. First, in the time of Aristotle, and even of Plato, a detailed analysis of the sounds and their syllabic combinations was already familiar to students. The rather minute description of the vowels and consonants which we find in Dionysios Hal. (De Comp. Verb. 14), with such a reference to Aristoxenos as leads nat-

urally to the supposition that substantially the whole chapter is drawn from him, was in the main inherited by Aristoxenos from an earlier generation. (Whether in the following chapter also, on syllables, Dionysios had Aristoxenos in mind and drew from him, we have no way of determining.) Secondly, such analysis of sounds and syllables was thus early considered a part of μετρική. It was regularly found — at least was naturally to be looked for — in the μετρικοί, who at this date would be generically those who wrote or lectured on meters, and would be the same class of people as Plato's οἱ ἐπιχειροῦντες τοῖς ῥυθμοῖς. In that generic sense Aristoxenos himself was a μετρικός; like the rest he had sections on the sound-elements or letters and on syllables; probably also these were followed by sections on πόδες and on μέτρα. What made his work remarkable, and the beginning of a new school, was not these chapters, in which he more closely conformed to tradition, but the doctrines of the ῥυθμικὰ στοιχεῖα, which put all these more traditional portions in a new light. We may even admit that his section on syllables perhaps contained such a recognition of the varying quantitative effects of consonants as was easily misunderstood and was later crystallized into the fallacious time-scale.

We cannot doubt, then, that the treatment of verse rhythms before Aristoxenos was largely "metrical," in this sense, that it set out from consideration of sounds and syllables, and only partially regarded rhythm in the other arts. Also, while we have no way of discovering what precise degree of elaboration the theory had received at any given date, it is clear that before the date of Plato's Kratylos a pretty complete system was regularly taught, if not already set forth in published treatises. The allusions of Aristophanes in the Clouds

(649 ff.) carry back a rather detailed nomenclature, that is, a system involving rather minute distinctions, into the fifth century. How much earlier a fully developed and widely accepted system existed we do not know.

Of course, throughout this earlier period a great deal of poetry was sung. The singer consciously kept the time, and the chorus leader beat time, that all might keep together. In such singing there could be no real confusion as to the duration of syllables. The singers therefore cannot have supposed, while singing, that all long syllables were equal, and that each was twice as long as a short syllable. The chorus of old men in the Agamemnon, rendering the words,

> *τὸν φρονεῖν βροτοὺς ὁδώ-*
> *σαντα, τὸν πάθει μάθος*
> *θέντα κυρίως ἔχειν,*

must have realized that they gave to the syllable -δω- as much time as to the two preceding syllables, a long and a short, together. Still we must remember that Greek song in general did no violence to the ordinary pronunciation of the verse, as regards time; at the utmost the singer merely reduced to greater precision, with a minimum of farther development, in the musical sense of the word, the rhythm which any untrained speaker naturally gave the lines in reciting them. This principle is beyond question for the earlier period, whatever departures from it may have been permitted later. And the point to be emphasized is the natural and unforced character of this rhythm, to the Greek. That is, no more training in music or in pronunciation was requisite to enable a Greek boy to read Greek poetry in the correct rhythm than is now requisite to enable a boy whose native tongue is English or German to read English or

German poetry in the correct rhythm. No theory at all was needful for that purpose, as no theory is now needful for English or German. For these two modern languages the theory of metric is as yet little better than chaos; but whether one holds a right or a wrong theory or none whatever, all readers alike, though they may have no ear at all for music, — if only they have a vernacular command of the language, and at the same time understand the meaning and are not specially deficient in taste, — read the same verses in substantially the same rhythm.

Nor does the poet himself need any theory to help him compose. As regards the fundamental character of rhythm in his verse he commonly has none; he may have a quite wrong one, and still compose well. He is guided by his ear, — that is, by native artistic sense trained by the study of poetry and by his own practice. Skill in manipulation, clear perception of the artistic value of effects, — these he must have; whether he can describe those effects in scientific terms is a matter of indifference. So the painter must have a sense of form and color, and great skill in manipulation; whether he has a scientific knowledge of optics and the chemistry of his pigments and the mathematics of perspective is of no consequence whatever for his art. Why should we suppose it to have been otherwise with the Greek poet? Music, so far as it dealt with scales, modes, tuning of stringed instruments, notation, and the like, the ancient poet-musician had to learn, as one has to learn the like now. These he had to know in a system or theory before he could use them; they stood in no such close relation to anything in universal daily life that one could acquire them unconsciously or half consciously. But the rhythm he did not need to be taught in that way; he

needed no theory of it, as our poets need none. It was involved in the syllables, and commonly had no other notation than the syllables in their ordinary spelling. The letters and syllables were therefore the natural starting-point for metrical theory, and a Greek poet could hardly be expected to feel a need either of going back of these or of adding to these any more elaborate theory of rhythm. He dealt with long and short syllables of varying constitution; the rhythm came of itself by the unconscious or half-conscious effect of a rhythmizing impulse which his readers and hearers fully shared with him, so that a more exact notation than the long and short syllables themselves furnished was not called for. Precisely so with us, mutatis mutandis. Our poet, in English or German, deals with accented and unaccented syllables of varying constitution; the rhythm of a given combination results from the unconscious or half-conscious working of a rhythmizing impulse which we share fully with the poet, so that in verse we ask for no more exact notation than is offered by the words in ordinary form. The illustration may be carried still farther.

There are many modern songs in which the time of the music stands in exactly the relation to the words which existed in Greek song. It is worth noting that a large proportion of the songs that from time to time acquire a more or less short-lived popularity among the less cultivated — songs put in circulation by the circus and the music-hall — are of this character as regards rhythm, and not infrequently words and tune are composed by the performer. But there are plenty of examples of a higher grade. The change from the speaking to the singing voice, from the speech-tune (*συνεχὴς κίνησις τῆς φωνῆς*) to the melody (*διαστηματικὴ κίνησις*

τῆς φωνῆς), brings with it a closer observance of time-ratios in the rhythm; that is the only rhythmical change made when one passes from the recitation to the singing of those lines. The naturalness of the process and the slightness of the change are neatly illustrated by the way in which children tend to read simple verse in "sing-song." An example of the extreme limit of the change is seen in Schubert's music to Goethe's Heiden-röslein. The natural rhythm of the words is observed throughout; but in certain places the time is filled out by prolonging the notes in place of the pause which one more naturally makes in simple reading. The first stanza runs:

Sah ein Knab' ein Röslein stehn,
Röslein auf der Heiden,
War so jung und morgenschön,
Lief er schnell, es nah zu sehn,
Sah's mit vielen Freuden.

In the melody, in $\frac{2}{4}$ time, each syllable has an eighth note or its equivalent, except that *schnell* is held a little and *es* correspondingly shortened (as one would naturally read it), and except farther at the end of each line. There the words *stehn*, *schön*, and *sehn* receive each a quarter note, so that the time which in reading is occupied by the syllable and a pause is filled out in singing with a musical tone. Finally at the end of lines two and five (which as words and syllables have only the length of *Sah ein Knab' ein Röslein*, without *stehn*), a reader waits, until the line and pause together equal in time the other lines. It is as if the second line were *Röslein auf der Heiden-flur*, and the reader substituted a pause for *-flur*. In the melody, however, this pause, like the one at the end of the other lines, is filled out

with musical sound, in this case by prolongation of the next to the last syllable; so that *Hei-* and *Freu-* receive each a quarter note, while *-den* also receives a quarter note, or an eighth note and eighth rest. Thus among other things illustrated by the stanza are two forms of the Greek catalexis. And to make the example all the more significant, the same words were set to music by another composer, Joh. F. Reichardt,[1] who employed the same time and preserved the natural rhythm of the words in the same way as Schubert, except in one mere trifle. That is, he wrote two eighth notes instead of a dotted eighth and a sixteenth for the words *schnell es;* and here the singer might very likely make no difference whatever in the rendering.

I have ventured to dwell on these details in order to make clear the following fact. In cases like this, if poet and musical composer had been one and the same, he would have needed for composing this and other tunes on the same principle, melodies only, without harmony or accompaniment of differing rhythm, no system of notation for the rhythm, and no detailed theory as to the ratios between the various syllables or notes. To place over the syllables signs indicating the place which each note had in the scale, leaving the time unmarked, except as the words in their ordinary spelling indicate the reading, would be sufficient for any singer who understood the system. If substantially all song were of this character, the poet-musician would feel no need of a detailed scientific theory so far as that concerns a statement of exact ratios between syllables, any more than at present the poet feels the need of such a theory for writing verse. The supposed modern poet-musician might, as the poet now may, either be quite uninterested

[1] In Peters's Liederschatz.

in the scientific theory on those points or hold an erroneous theory, and still write good poetry in exquisite rhythm, to which, if he possessed the required skill in the other departments of music, he could add exquisite melody. Nor do I see that the addition of a dance, itself also conforming in rhythm to the words, would alter the requirement in the least as regards rhythmical theory. That would be implicitly contained, sufficiently for all his artistic needs, in the doctrine of sounds and syllables, and of feet and larger units as made up of combinations of syllables, — a doctrine leaving room for a considerable amount of uncertainty as to some of the exact ratios within the foot.

Now this was precisely the case with the Greeks. Before Aristoxenos students of verse-forms were content to take their start from syllables, studying sounds in order to explain the constitution of the syllables, treating feet as made up of syllables, and larger units as made up of feet. It was also clear that the normal feet — all combinations of syllables to which they gave the name πόδες — contained, when sung, a part marked and accompanied by the down-beat and also a part that was sung while the beating hand or foot was returning to the starting-point. These were the portions known as thesis and arsis, standing to each other in the ratio of 1 : 1, 2 : 1, or 3 : 2. So much it was needful to know in order to beat time or to keep the time in singing. Farther, in regular dactylic or anapæstic verse, and in the vast majority of cases in iambic, trochaic, and paionic verse, it was clearly brought out in the process of beating time that the long syllable had twice the length of the short. That ratio was therefore naturally given as the general rule, in all the normal feet as presented in the theory. But precisely what ratios resulted when in ῥυθμοποιΐα

(i. e., in the actual production of rhythm in poetry) an arsis was not represented by a separate syllable, or when a line was treated as the line *Röslein auf der Heiden* is in Goethe's stanza and Schubert's or Reichardt's music, or when feet of different γένη were mingled in one group, — on such points they might easily be somewhat indifferent, or might hold views that within certain limits were not in agreement. In practice, in reading and singing, there would still be agreement, though people who agreed in practice might differ in their explanation of what they did, as is frequently the case with readers of modern verse.[1] At any rate we get no distinct indication of interest in such points until Aristoxenos took them up.

He was neither poet nor musical composer, but a scholar and man of science, the pupil of Aristotle. He was also a man of taste, fonder of the great classical poets and musicians than of the productions of his contemporaries. The scientific aspects of the arts interested him, and he hoped that a better statement of theory would be an influence on the side of better taste. He treated all rhythms as primarily combinations of time ratios, starting from the χρόνος πρῶτος instead of the syllable as the unit. This new point of view, once introduced into the science of metric, was never again wholly lost.

But neither did the new method penetrate and master the science completely. And the reasons are not hard to understand. To begin with, for practical purposes

[1] Tennyson is quoted by his son, in his Life of the poet, as saying that "few educated men really understand the structure of blank verse," and as remarking on the way in which Englishmen "confound accent and quantity." If nothing else, this illustrates the differences of theory referred to. And it is notorious that scholars are widely at variance in their description of common English meters, which all agree substantially in reading.

the older method seemed good enough so long as the language still lived, with quantities and intonations substantially unchanged, and poetic production, even though not of the greatest, still going on. And then the method of Aristoxenos had the disadvantage, for popularity, that always inheres in the abstract over the concrete. I mean this. Syllables, words, verses, are something audible, visible, significant; every one felt he knew pretty well what these were. But time is abstract, impalpable, an empty something that accompanies the sounds and is not easily conceived alongside them. A *χρόνων τάξις* is not easily described or grasped, even by musicians. Ancient musical notation gave far less help than ours does. But the rhythmic of Aristoxenos required one to fix his attention on time, time-intervals, and time-ratios, apart from the syllables, notes, or steps in which those time-relations were embodied, — to separate from the various familiar *ῥυθμιζόμενα* a system of *ῥυθμοί* in the abstract. We ourselves, trained as we all are in geometry and algebra, find that not easy; most students of modern verse have absolutely refused to make an effort which appears to them so useless and so fallacious. Aristoxenos found no little difficulty in making people see precisely what he meant by his *πρῶτος χρόνος* even (280, 282, Mb.). These *ῥυθμοί*, which had no concrete existence except in one or another *ῥυθμιζόμενον*, the student was expected first to contemplate in an abstract system and then watch them, as it were, reëmbodying themselves in words, steps, and notes, with more or less variation between the theoretical form and the concrete. Aristoxenos felt obliged to warn his readers repeatedly of this variation, reminding them to distinguish carefully *ῥυθμός* and *ῥυθμοποιία*.[1] Not merely is this doctrine of

[1] See the passages below, p. 104 ff.

an abstract system, which is varied greatly in practical application, difficult for us to grasp and keep clearly before us in reading our fragments of Aristoxenos; it is evident also that the author of it felt himself to be making a considerable demand on the understanding of his contemporaries. All things considered, it is no way surprising that his method failed of universal, or even very general, acceptance.

All the more natural is it that in the later period students of poetry and writers on metric should pretty generally approach the subject from the "metrical" standpoint, that is, should deal with syllables, feet, and meters directly, with little or no reference to abstract rhythmic. In so doing they simply adhered to the older way of looking at the matter, and to a method that was practically sufficient for readers to whom Greek and Latin were living tongues, modern still if also ancient. I would go a step farther in recognition of the metrici, early and late alike. At bottom, if we take their terms in their sense, they were right. We gain nothing, and are certainly mistaken, if we lightly assume that Hephaistion and the rest, together with the earlier writers whom they copied or followed, were ignorant of what they wrote about. First we must understand them; next, if a doctrine still seems clearly quite untenable, we should try to trace the error, with the presumption that the error will be found intelligible and not unreasonable, perhaps even instructive, if we can only discover where and how it came in. At the risk of some repetition — for the point is a fundamental one — let us make a little farther attempt to put ourselves in their place and see the matter with their eyes for the moment.

I hope it has been shown that the syllable was a natural starting-point for a systematic exposition of the

formal side of versification. In the vast majority of cases, in all meters, the long syllable was seen to be twice as long as the short syllable. In every foot, that is, in every small combination of syllables to which they originally gave the name πούς, such that a verse might regularly consist of a succession of like feet (as dactyl, anapæst, spondee, trochee, iambus, ionic, cretic), that ratio always holds. If anything at all was said about the matter — and in connection with song the matter could not be passed over — that ratio was the one to give; it was the normal and ordinary ratio. True, in practice the normal feet were sometimes varied by the omission of a syllable or two, so that various other ratios appeared. But viewed from their starting-point these ratios, though by no means rare, were rather abnormal; and they did not require to be described in detail for the reader or speaker with a vernacular knowledge of the language. Absence of the arsis syllable or syllables, and the adjustment required — whatever it was — when spondees or dactyls or anapæsts were mixed with trochees or iambi, caused no practical difficulty to the native. For conductor and singer alike we must remember that the natural pronunciation of the words, familiar to all, constituted the basis; the situation was not what it is when a modern conductor leads an orchestra or chorus, rendering music that employs far more complicated ratios, all of necessity marked with precision in our notation. If the Greek composer in a complicated lyric rhythm made combinations to which the ordinary pronunciation of the words was not a sufficient guide, that was his special affair, to be indicated in his notes by additional signs and then taught to the singer; the general writer on metric did not need to consider it. The ear could recognize easily the normal ratio of 2 : 1,

and could always distinguish easily the long from the short; but it was often not easy, it was in some cases impossible, to state exactly the ratio between adjacent long and short in the combinations not included in the normal feet, although, be it always remembered, there was no practical difficulty at all in rendering them, because the innate rhythmical sense — the "unconscious automatic mathematician," — was the same in all.[1] In view of all these considerations it is not surprising, and does not imply stupidity or ignorance, that the metrici took no account of any other than the common ratio, that they applied the term dactyl to any long followed by any two shorts, that they called any two adjacent longs a spondee, and otherwise applied terms in a way that is misleading, unless one bears in mind their point of view, and for what manner of people they were writing. Especially after the ancient music was partly lost, and the ancient dance wholly lost; when the more complicated measures of the old lyric compositions were not often sung, if at all, but were commonly read, and read, of course, without that fuller and more perfect rhythmic swing which comes of itself in passing from the speaking voice to the singing voice, but which may sound affected in reading; and when, finally, the old pronunciation was changing and the quantitative system was breaking up, — then, I say, it was fairly inevitable that writers on versification should adhere pretty closely to the "metrical" method of presentation. Of course it

[1] "There is in each competent artist a sort of unconscious automatic mathematician, who, like the harmonist in music, the colorist in painting, resolves in his way the problem of sight or sound which the scientist puts into an equation." (La Farge, Considerations on Painting, p. 130.) The rhythmic sense that is in every reader of verse is the same kind of a mathematician, though not necessarily in so high a degree of development as in the creative artist.

does not follow that they made no mistakes. They were compilers, they sometimes included inconsistent doctrines, their rare attempts at originality were not likely to be successful; in the latest period the affair is complicated by the fact that they sometimes had in mind more or less the accentual principle, which was gradually gaining on the quantitative; their theories as to the development of meters from one another are generally worthless, because their authors had and could have no conception of true historical method in investigating such problems. Still it is true that not a few of their statements which at first appear ignorant and worthless are in fact sensible, and not inconsistent with Aristoxenos, when seen through their eyes. To illustrate the point before going farther, let us look briefly at the elegiac pentameter.

Hephaistion's account of this line is as follows:

Τοῦ δὲ δακτυλικοῦ πενθημιμεροῦς δὶς λαμβανομένου γίγνεται τὸ ἐλεγεῖον· ἀλλὰ τὸ μὲν δεύτερον αὐτοῦ μέρος ἑπτασύλλαβον ἀεὶ μένει, ἐκ δύο δακτύλων καὶ συλλαβῆς, τὸ δὲ πρότερον κινουμένους ἔχει τοὺς δύο πόδας, ὥστε ἢ δακτύλους αὐτοὺς γίγνεσθαι ἢ σπονδείους, ἢ τὸν μὲν πρότερον δάκτυλον τὸν δὲ δεύτερον σπονδεῖον· ἢ ἀνάπαλιν τὸν μὲν πρότερον σπονδεῖον τὸν δὲ δεύτερον δάκτυλον· παρ' ἣν αἰτίαν τὸ μὲν δεύτερον μέρος ἀεὶ διπλασιαζόμενον ἐλεγεῖον ποιεῖ, τὸ δὲ πρότερον οὐκέτι, ἐὰν μὴ ἐκ δύο δακτύλων συνεστήκῃ. (P. 52 W.)

To the same effect Marius Vict. says:

Compositus est [versus pentametrus] de hexametro ita, ut de tertio pede partem orationis complente semipes tollatur, itemque ex ultimo pede, quem spondeum esse debere in dubium non venit, adaeque postrema syllaba retrahatur. (P. 107 K.)

The first example which he gives is the hexameter:

Mars pater haec poteris quae nos quoque posse negamus,

which is changed to a pentameter by omitting nos and -us:

Mars pater, haec poteris quae quoque posse negam.

The next example in both forms is

barbarico postes auro spoliisque superbi,
barbarico postes aur spoliisque super.

In like manner Aristides Q., enumerating the *τομαί* of the dactylic hexameter, gives first, *ἡ μετὰ δύο πόδας εἰς συλλαβήν, ἣ καὶ διπλασιαζομένη ποιεῖ τὸ ἐλεγεῖον, οὗ πέφυκεν ἀρετὴ τὸ τὴν μὲν τῆς προτέρας συζυγίας συλλαβὴν περιττὴν ἐξ ἀνάγκης μακρὰν ἔχειν, τὴν δὲ δευτέραν συζυγίαν ἀναμφιβόλως ἐξ ἀμφοῖν συγκεῖσθαι δακτύλων.* (P. 51 f. Mb.)

With these descriptions, apparently quite simple and clear, agree fully those found in other grammarians. The verse is consistently represented as made up of two dactylic penthemimeres, or twice two and a half feet, with a word ending always at the end of the first two and a half. Modern scholars have been unanimous in understanding this to mean that, in reading or singing, the syllable or half foot at the end of each half of the line stood rhythmically for a whole foot; that the time was filled out by prolongation or pause or both combined, so that the entire line was equal, in actual time, to a hexameter.

It is true that our metrici mention also another view which treated the line as rhythmically a true pentameter, of the form

$$- \overline{\smile} | - \overline{\smile} | - - | \smile \smile - | \smile \smile - |$$

This view has been lately defended as the only sound one. In the article before quoted (Hermes, 35, p. 308 ff.)

G. Schultz brings forward in favor of that view, (1) the antiquity of the name pentameter, (2) passages in the grammarians which call the third foot a spondee and the last two feet anapæsts, (3) the impossibility that the ancients, while they still sang elegiac verses, beating time, could have erred by an entire half-foot in the middle of the line. In farther support of this manner of scanning he maintains that ictus in the sense of increased stress accompanying the down-beat was not present at all in ancient verse. This last question, on the meaning of ictus and the presence or absence of stress, had been pretty well threshed out, shortly before Schultz's article appeared, by Bennett (Am. Journ. Phil., XIX, 361-383), who took substantially Schultz's view, and on the other side by Hendrickson (A. J. P., XX, 198-210. The discussion was continued in the same journal, XX, 412-434). This part of Schultz's argument, though important for his view, I therefore pass by, and go at once to the heart of the question.

The antiquity of the name pentameter must be conceded; also that no less an authority than Quintilian speaks of the 'pentametri medius spondius,' which seems to carry with it the treatment of the last six syllables as two anapæsts. But let us look more closely. We will take first the passage on which Schultz especially relies, Quintilian IX, 4, 97 f., which reads:

Non nihil est quod supra dixi multum referre, unone verbo sint duo pedes comprehensi an uterque liber. sic enim fit forte 'criminis causa,' molle 'archipiratae,' mollius si tribrachys praecedat, 'facilitates,' 'temeritates.' est enim quoddam ipsa divisione verborum latens tempus, ut in pentametri medio spondio, qui nisi alterius verbi fine alterius initio constat versum non efficit.

From this the inference of Schultz is: Durch den

Ausdruck 'latens tempus,' sowohl wie durch das erste Beispiel 'criminis causa,' wird uns bezeugt, dass die Pause in der Mitte des Pentameters ebenso verschwand, wie die zwischen zwei gewöhnlichen Worten in fortlaufender Rede.

But this is palpable misinterpretation. The point of Quintilian's comparison, it is true, lies evidently in that 'latens tempus,' which exists in 'criminis causa' as in 'pentametri medio spondio.' But it does not follow that the likeness lay in the fact that in both cases the 'latens tempus' vanished, was imperceptible. 'Latens tempus' can only mean a time-interval not marked by or filled with a distinct speech-sound, — that is, a pause, or perhaps prolongation of the preceding syllable. It exists 'ipsa divisione verborum,' and in the phrase 'criminis causa,' employed by an orator at the close of a sentence, as in the middle spondee of the pentameter. If the sentence stopped here, as it is made to in Schultz's quotation, one might perhaps maintain that there is no such pause in either place, and that (in spite of the word-order) 'latens tempus' means no pause at all; in which case one could not but wonder why Quintilian used the illustration. But the sentence does not stop here. Quintilian adds, to make clear what he means by 'latens tempus' and wherein the likeness lies, the clause above given: "which [namely, the 'medius spondius'] does not make the verse unless it consists of the end of one word and the beginning of another." Even if this clause were not farther elucidated by similar explanations in other authors, it would show that Quintilian felt in that middle spondee a 'latens tempus' produced by the very division between the words, — a pause or break of some kind, not felt at all between successive syllables of the same word, and distinctly longer than

that imperceptible one, often non-existent, between two successive and closely connected words in continuous discourse. And then turning to the preceding context, reflecting that Quintilian is speaking of the rhythmical close of the sentence, we may recall that precisely at the close of a sentence of serious character, where rhythm becomes of special importance, any public speaker nowadays will often avail himself of the break between words, even closely connected words, to make the rhythm more pleasing by such a slight prolongation or pause as would not be natural between similar words in a different situation. Thus Quintilian's illustration becomes intelligible; but it is no longer quotable as evidence that the 'medius spondius' of the pentameter was identical with the spondee at the end of a hexameter.

And then that last clause must be viewed in the light of other accounts of the same phenomenon. In Scholia B. to Hephaistion (p. 171 f. W., p. 19 f. H.) we find the statement that some say the *ἐλεγεῖον* is really *πεντάμετρον*, the third foot being a spondee, the fourth and fifth anapæsts. But, the author adds, "it is better to measure it in this way: Since it is in fact divided *εἰς δύο πενθημιμερῆ* (and the penthemimeres consists of two feet and a syllable) it admits in the first two places dactyl or spondee indifferently, then a long syllable ending a word, and after this again a second penthemimeres of two dactyls and a syllable." Why, one asks, should this more complicated division survive, why particularly should it be considered better, even in Byzantine handbooks, if that middle spondee was in reading and singing always no other than a common spondee? Indeed, why should a word always end in the middle of that spondee? The hexameter, nearest relative of the pentameter, has

no one such fixed division. Terentianus Maurus also (1753–1800) recounts at some length the two different measurements, and describes that strange way of scanning whereby, in the practice of some, the syllable that ended the first half-line was saved out and put with the syllable that ended the second half, to make a spondee at the end. Those who did this evidently were led to such a queer procedure by the feeling that there was something unusual about that middle spondee. Marius Vict. also (p. 107–110 K.) goes pretty fully over the same ground with Terentianus.

But a later paragraph of Marius Vict. throws farther light on the matter, as follows:

Hoc quoque notandum in enuntiatione pentametri elegiaci: nam plerumque aurem fallit, ut in illo graeco versu,

ἡμεῖς δ' εἰς Ἕλλης πόντον ἀπεπλέομεν.

nam si coniunctim Ἑλλήσποντον enuntiarimus, effugerit aurium sensum, ut nequaquam versus esse credatur. at si per hemistichium pronuntiemus, ipsa subdistinctione genus metri declarabimus, ita ἡμεῖς δ' εἰς Ἕλλης, dehinc πόντον ἀπεπλέομεν. unde pentametrus duobus pedibus et semipede colon terminare debet, ut qui audierit, antequam percutiat, versum intellegat, velut

labitur hinc Helles, pontus in Oceanum.

item

venerunt inter, lunia sancta polo.

nam si per se dicas 'inter' et per se 'lunia,' media subdistinctione interposita, recipiet formam elegiaci. (P. 112 K.)

I see no room for doubt about the meaning of this. To Marius Vict. and to his authority, if that middle spondee was pronounced as an ordinary spondee, 'con-

iunctim,' there was no pentameter. To illustrate the point examples are chosen which have in the middle such combinations as one would naturally, unless warned, read together, as compound words. But that would destroy the meter, 'ut nequaquam versus esse credatur.' If on the other hand we separate the two hemistichs, the whole will then receive the form of the elegiac line. This makes Quintilian's remark plain. We now see why a word must end with the first half-line, namely, to give distinct warning of the break, to indicate that this is not an ordinary spondee, "that the listener may understand the verse even before he beats the time through it." We now see also why the second half-line must properly have two dactyls. If either were a spondee, it would be less clear, or quite uncertain, which was arsis and which thesis. What reason for this rule of the second hemistich is conceivable on the supposition that there was no such break in the movement at the middle of the line? One seeks in vain for a parallel in any other dactylic verse.

To this evidence must be added the distinct statement of Augustine (De Mus. IV, 14, quoted, and connected with Quintilian IX, 4, 98, by Christ, Metrik, p. 94 f.):

Duo constituuntur non pleni pedes, unus in capite, alter in fine, qualis iste est

gentiles nostros inter oberrat equos.

sensisti enim, ut opinor, me post quinque syllabas longas moram duorum temporum siluisse, et tantundem in fine silentium est.

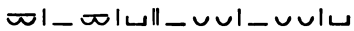
How can one ignore and treat as non-existent such a mass of well known evidence, accessible in so popular a handbook as Christ's? Schultz and those who take his view are certainly bound to offer some

explanation of these passages that make against their doctrine of the pentameter.

And now let us look again at the name pentameter and the common description of the line, recalling the antecedent conception on which the name and description are based. Aristoxenos and the metrici alike called nothing a foot that consisted of less than two syllables. Aristoxenos says:

Ὅτι μὲν οὖν ἐξ ἑνὸς χρόνου ποὺς οὐκ ἂν εἴη φανερόν, ἐπειδήπερ ἓν σημεῖον οὐ ποιεῖ διαίρεσιν χρόνου· ἄνευ γὰρ διαιρέσεως χρόνου ποὺς οὐ δοκεῖ γίνεσθαι. (P. 288 Mor.)

Whoever will examine these words attentively in their context will see that χρόνου in the first clause signifies, not χρόνος πρῶτος, but χρόνος ποδικός, — that is, an arsis, thesis, whole foot, or some time-interval that is represented by a separate syllable in the fundamental normal foot. (See below, p. 134). He means that one syllable, however prolonged, cannot make a foot, because its time, a longer χρόνος ποδικός, is not audibly divided. The ancient conception of the πούς, unlike our conception of the measure or bar in music, involved as essential an audible division of its time by the transition from one syllable or note to another. Herein Aristoxenos agreed with the metrici from the earliest to the latest. Supposing then that the pentameter as sung had the form



how should the early metrician describe it? Obviously, as made up of two parts, each consisting of two and a half feet. He could say that without in the least meaning that the half-foot was strictly two-timed. He could not say that each half-line was made up of three feet, the last consisting of one prolonged syllable. In syllabic character that tetraseme was but a half-foot. He might

indeed have said that each half-line was made up of two feet and a long syllable, the latter equivalent to a foot. But it could hardly occur to him that the phrase explaining the character of that last syllable was necessary. For his readers it was not necessary, and he could not foresee our ignorance. In many cases, too, — always when at the end of the line a break in sense occurs, and often in the middle — that long syllable was not, in recitation, so prolonged, but the time was naturally filled out by a pause. I do not see then how he could think of the line otherwise than as made up of twice two and a half feet. And twice two and a half is five. It was inevitable that the name "five-measure" should become current alongside of ἐλεγεῖον. The true character of that half-foot, which they saw no need of entering into, is indicated to us by the care with which the metricians emphasize the break between the hemistichs. All insist that a word must end there. Every full description that we have records, as the ordinary division of the line, that into two penthemimeres; even writers who describe the division into five entire feet, the last two being anapæsts, call the other division better (Schol. B. to Heph., cited above) or more usual (Diomedes, p. 503 K.); Marius Vict., by the very terms he employs in stating that division (p. 110 K.), shows that to him the second hemistich was dactylic and not anapæstic, and the passage quoted above from him indicates distinctly how the line sounded to him. The fact also recorded by him (p. 110, K.) that some allowed a short syllable at the end of the first hemistich, as being a sufficiently independent κῶλον to admit the syllaba anceps, is inexplicable if that syllable was really part of an ordinary spondee. That peculiar method of scanning which put the two half-feet into a spondee at the end, and so made

certain that one felt the two feet preceding that artificial final spondee as dactyls, looks the same way.

Furthermore, all the testimony which looks the other way finds easy explanation. Although elegiacs continued to be sung down to Horace's time or later, they were not commonly sung, but recited or read. Now a little unprejudiced experimenting will convince any one with an ear for rhythm and a good control over his own rhythmical performance that it is not difficult, in reciting or reading — personally I should say it is not difficult in singing either — to pass from one method to the other, still observing exact time. Even for us this is not difficult, in spite of our habit of giving a sledge-hammer stress, in English and German, for the ictus. We make the middle spondee by giving equal stress to both syllables, and so effecting a shift in the rhythm, such as we often make unconsciously in prose and in common speech. I should think the middle spondee would be still less difficult for a Frenchman. For a Greek or Roman, who connected with the ictus or down-beat so slight a stress, at the utmost, that he was hardly conscious of it, and made little or nothing of it in his theory, it must have been comparatively easy to make the transition from the original movement to that which perhaps in the later period, and in reading, became more or less current. Except for the great frequency of the meter, so that every one was perfectly familiar with the type, the elegiac pentameter would come clearly under the *μέσα μέτρα*, or ambiguous meters, of Aristides Q. His description is:

Μέσα δὲ καλεῖται μέτρα ὅτε δύο ποδῶν ἀντιθέτων εἰς μεταξὺ πίπτων, οἰκειότητα πρὸς ἀμφοτέρους ἔχων, δυσδιάκριτον ποιεῖ τὴν βάσιν· οἷον εἰ, ἐκκειμένου μὲν ἑνὸς δακτύλου διμέτρου δὲ ἀναπαιστικοῦ, κατὰ μέσον πέσοι

σπονδεῖος, ἄδηλον πότερα δύο φήσομεν εἶναι μέτρα, τὸ μὲν δακτυλικὸν τὸ δ' ἀναπαιστικόν, ἄμφω δίμετρα, ἢ τὸ σύμπαν τετράμετρον ἀναπαιστικόν· καὶ ἐπ' ἄλλων δὲ μέτρων ταὐτὸν θεωρεῖται. (P. 57 Mb.)

The case is familiar enough: the true rhythm of — ∪ ∪ — — ∪ ∪ — ∪ ∪ — cannot be determined without its setting. The sequence of syllables that make up the elegeion is equally ambiguous, — except indeed, as was said, that the type is so familiar.

And yet, as we have seen in the case of Quintilian, not every one who spoke of a middle spondee is to be assumed to have had in mind this later method of reading. For it was a natural result of ignoring differences in length between syllables of the same general class, long or short, that a metrician might call any two successive long syllables a spondee, as he might call any long syllable followed by any two shorts a dactyl, any two shorts followed by any long an anapæst, and so on. Also, since the long was ordinarily and theoretically twice the length of a short, the metricus counted them so, and might sum up the "times" of any syllabic series on that basis. Unmistakable illustrations of both practices are easily found, and in many cases lead to no misinterpretation. For example, in the passage before translated (p. 34) from Schol. B. to Hephaistion (p. 171 f. W.; 19 f. H.) the description of the ἐλεγεῖον begins:

Τὸ δὲ ἐλεγεῖον μέτρον τινὲς μὲν πεντάμετρον αὐτό φασιν εἶναι, συντιθέντες τὰς μὲν δύο χώρας αὐτοῦ, τὴν μὲν πρώτην καὶ τὴν δευτέραν, ἀπὸ δακτύλου καὶ σπονδείου ἀδιαφόρως, ἢ ἀμφιμάκρου ἢ παλιμβακχείου, καθαρῶν μέντοι καὶ ἐν τάξει δακτύλων κειμένων, ὡς καὶ ἐν τῷ ἡρωικῷ εἴρηται.

Here we have the ἀμφίμακρος and παλιμβακχεῖος included among the feet that may occur in the pentameter

or hexameter; but we do not misunderstand the writer. He applies the name amphimacer, for example, to any succession of syllables that, taken by themselves, would be called respectively long, short, long. Such a "foot" may stand for a dactyl whenever, in that particular combination, it is a dactyl, the last syllable being shortened before an initial vowel; but even in that case a metrician might still call it an amphimacer. To like effect Marius Vict.:

Memineris autem saepe Graecos huic metro molossum et palimbacchium et creticum loco dactyli sub lege syllabarum communium admiscere. nam et apud nos similis versus reperitur in quo primus amphimacrus est, ut 'insulae Ionio in magno.' (P. 72 K.)

Again, near the close of his account of the iambic trimeter with its numerous permissible substitutions (p. 83 K.), Marius Vict. tells us: Et syllabarum quidem incrementa sic recipit ut a XII syllabis ad XVII syllabas protendatur, temporum autem ita versus habet incrementa, ut a XVIII temporibus ad XXIIII porrigatur. Obviously he obtains the larger number of "times" by counting one for every short and two for every long syllable anywhere admissible. No one is misled by this. If the irrational syllable existed anywhere it existed in iambic verse when a long syllable came where the pure iambic would have a short syllable; nor do I suppose Marius Vict. was unaware that his number twenty-four was correct only in a conventional sense. He cannot have supposed the line with the full number of substitutions to be really equal in length to the dactylic hexameter. So when Dionysios Hal. (De Comp. Verb. 18) analyzes clauses from the Periklean funeral oration. The first kolon, *οἱ μὲν πολλοὶ τῶν ἐνθάδε ἤδη εἰρηκότων*, he divides into the following feet: first three spondees,

then an anapæst, then a spondee, then a cretic. The following kolon, *ἐπαινοῦσι τὸν προσθέντα τῷ νόμῳ τὸν λόγον τόνδε*, he divides into two *ὑποβακχεῖοι*, a cretic, again two *ὑποβακχεῖοι*, and a final syllable. It is incredible that the rhetor supposed he was describing the actual spoken rhythm, in the sense of Aristoxenos; he was giving the quantities of the syllables in the conventional way, and his readers so understood him. Quintilian was doing the same in speaking of 'criminis causa' and illustrating the 'latens tempus' between those words by the 'pentametri medius spondius.'

But enough has been said, I hope, to show that the point of view and method of treatment adopted by the metricus were not only older than those of Aristoxenos, but also natural and reasonable; that some doctrines of the metrici, when interpreted in the sense intended, though seemingly at variance with Aristoxenos, are in fact in harmony with his doctrines, and true.

There is farther an interesting series of passages defining or describing *ῥυθμός*, most of them carefully differentiating this from *μέτρον*. The most suggestive of these are subjoined, with some comments.

(1) 'Ρυθμὸς δὲ τί ἐστι; — (a) *χρόνου καταμέτρησις μετὰ κινήσεως γινομένη ποιᾶς τινος.* (b) *κατὰ δὲ Φαῖδρον ῥυθμός ἐστι συλλαβῶν κειμένων πως πρὸς ἀλλήλας ἔμμετρος θέσις.* (c) *κατὰ δὲ* Ἀριστόξενον *χρόνος διῃρημένος ἐφ' ἑκάστῳ τῶν ῥυθμίζεσθαι δυναμένων.* (d) *κατὰ δὲ* Νικόμαχον *χρόνων εὔτακτος κίνησις.* (e) *κατὰ δὲ* Λεόφαντον *χρόνων σύνθεσις κατὰ ἀναλογίαν τε καὶ συμμετρίαν πρὸς ἑαυτοὺς θεωρουμένων.* (f) *κατὰ δὲ* Δίδυμον *φωνῆς ποιᾶς σχηματισμός. — ἡ μὲν οὖν φωνὴ ποίως σχηματισθεῖσα ῥυθμὸν ἀποτελεῖ, γίνεται δὲ οὗτος ἢ περὶ λέξιν ἢ περὶ μέλος ἢ περὶ σωματικὴν κίνησιν.* (Baccheios 93, p. 313 J.)

It is plain that definitions (a), (c), (d), (e), and the

last clause (*γίνεται δὲ*, etc.), regard rhythm as primarily a matter of "times"; while definition (f), and still more clearly (b), start from the syllable, that is, are "metrical" in character. Yet it is equally plain that these definitions are not inconsistent with one another. They differ in extension, and in degree of precision and lucidity; but so far as it goes (b) is entirely sound. As v. Jan points out in his edition (p. 289 f.) the entire passage 89-101 shows a similar mingling, and reminds one of the *συμπλέκοντες τῇ μετρικῇ θεωρίᾳ τὴν περὶ ῥυθμῶν τεχνολογίαν*. Again, among definitions of *πούς* discussed by Hoerschelmann (Ein gr. Lehrbuch d. Metrik, p. 25 ff.) distinctively "metrical" in character, such an addition as the clause *ἐξ ὧν* [or *ἐν αἷς*] *γνωρίζομεν τὸ τοῦ μέτρου εἶδός τε καὶ μέγεθος* is identical in substance, as far as it goes, with the definition of Aristoxenos, *ᾧ σημαινόμεθα τὸν ῥυθμὸν καὶ γνώριμον ποιοῦμεν τῇ αἰσθήσει*. So in the various lists of feet, those who arrange these according to the number of *χρόνοι*, like Dionysios Hal. and Hephaistion, in so far approach the "rhythmical" view.

(2) *Ὁ δὲ αὐτὸς ῥυθμὸς οὔτε περὶ γραμμάτων οὔτε περὶ συλλαβῶν ποιεῖται τὸν λόγον, ἀλλὰ περὶ τῶν χρόνων, τὰ* [*τοὺς* P.] *μὲν ἐκτείνειν κελεύων τὰ* [*τοὺς* P.] *δὲ συνάγειν τοὺς δὲ ἴσους ποιεῖν ἀλλήλοις. καὶ τοῦτο ποιεῖ μενόντων τῶν συλλαβῶν καὶ τῶν γραμμάτων.* (Excerpta Neapol. 21, p. 418 J.)

When read in connection with the remarks above cited (p. 16 f.) from Aristotle and Plato, this excerpt is seen to contain a polemic recognition of the metrici. Especially noteworthy is the last sentence. It accords perfectly with Aristoxenos in teaching that, while syllables and letters remain, with no diminution of essential characteristics, the times or quantities of the same syl-

lables may vary. Therefore we are forced, if we would deal adequately with rhythm in language, to go behind the syllable and its parts, keep our attention on the time-intervals, and consistently treat these, rather than syllables, as the real elements of rhythm.

(3) *Διαφέρει ῥυθμοῦ τὸ μέτρον ᾗ τὸ μὲν μέτρον πεπηγότας ἔχει τοὺς χρόνους, μακρόν τε καὶ βραχὺν καὶ τὸν μεταξὺ τούτων τὸν κοινὸν καλούμενον, ὃς καὶ αὐτὸς πάντως μακρός ἐστι καὶ βραχύς, ὁ δὲ ῥυθμὸς ὡς βούλεται ἕλκει τοὺς χρόνους· πολλάκις γοῦν καὶ τὸν βραχὺν χρόνον ποιεῖ μακρόν.* (Longinus on Heph., p. 84 W; p. 2 H.)

With this must be considered the two following.

(4) Rhythmus est pedum temporumque iunctura velox divisa in arsin et thesin vel tempus quo syllabas metimur . . . differt autem rhythmus a metro, quod metrum in verbis, rhythmus in modulatione ac motu corporis sit; et quod metrum pedum sit quædam compositio, rhythmus autem temporum inter se ordo quidam; et quod metrum certo numero syllabarum vel pedum finitum sit, rhythmus autem numquam numero circumscribatur. nam ut volet protrahit tempora, ita ut breve tempus plerumque longum efficiat, longum contrahat. (Marius Vict., p. 41 f. K.)

(5) Inter metrum et rhythmum hoc interest, quod metrum circa divisionem pedum versatur, rhythmus circa sonum, quod etiam metrum sine plasmate prolatum proprietatem suam servat, rhythmus autem numquam sine plasmate valebit. (Atilius Fortun., p. 282 K.)

That these three passages are closely related is clear, as also that all alike imply a true notion of the nature of rhythm. The words 'temporum inter se ordo quidam' are a perfect translation of Aristoxenos's definition *χρόνων τάξις ἀφωρισμένη*. But in them all appears also a conception of 'metrum' that calls for closer attention.

The conception includes these factors. First, 'metrum' is concerned with words and syllables, not with other *ῥυθμιζόμενα*. So far we are on old ground. But secondly, the times employed are fixed, long or short, as over against 'rhythmus,' which varies the ratios greatly. Thirdly, a series of words that falls under the conception of 'metrum' (*i. e.*, a concrete 'metrum') exhibits its proper character as 'metrum' when pronounced in a simple manner, with no modulation of the syllables in order to make the time intervals more perfectly rhythmical; in contrast herewith, 'rhythmus' will never be quite right without such modulation or moulding (*πλάσμα*) of the times. The last mentioned factor in the conception of 'metrum' is clearly stated only in the sentence from Atilius; but that sentence furnishes the most natural explanation of the phrases *πεπηγότας ἔχει τοὺς χρόνους* and 'certo numero syllabarum vel pedum finitum,' over against the phrases *ὡς βούλεται ἕλκει τοὺς χρόνους* and 'ut volet protrahit tempora,' etc. That interpretation is confirmed by the following.

(6) Siqua autem apud poetas lyricos aut tragicos quispiam reppererit, in quibus certa pedum conlocatione neglecta sola temporum ratio considerata sit, meminerit ea, sicut apud doctissimos quosque scriptum invenimus, non metra sed rhythmos appellari oportere. scribimus igitur ita de metris, ut ab his rhythmos procul removeamus, atque in his omnino nullum sit, in quo non pedum defixa ratio cum dulcedine adsociata atque permixta sit. (Mallus Theodorus, p. 586 K.)

Taken together, then, the four preceding passages tell us this. Some of the metrici — should we not say all, so far as we have them? — recognized that the syllabic principle, with its fixed ratio of 2 : 1, was not adequate to explain the rhythm of many passages in the lyric and

tragic poets; they accordingly got around the difficulty by making a division between meters. Those in which they perceived the rhythm to be too complicated for the "metrical" theory to explain passably were set off as *ῥυθμοί*, and left to be elucidated by the *ῥυθμικοί* and *μουσικοί*; those which the "metrical" theory seemed to describe adequately — in which, namely, the ratio 2 : 1 was not in too crying contradiction to the facts — they retained as the proper sphere of metric.[1] The latter — the metra in this special sense — included all of the recitative and march type and the simpler melic forms, — all in which a single line or a brief strophe was many times repeated with slight variation or none; this covers all the poems of Horace and Catullus, for example. The *ῥυθμοί* on the other hand, such as the more elaborate and varied strophes of choral lyric or of the monodic *κόμμοι* and *μέλη ἀπὸ σκηνῆς* of tragedy, they did not meddle with. Accordingly we find that our metrici in fact hardly touch upon those more complicated melic forms. In precisely that portion of ancient poetry where we find the greatest difficulty in understanding the versification the metrici give us no help. As regards the conception of Marius Vict., the above passage is supplemented by others. In the section on feet (p. 43 f. K.) he defines the foot, in full accord with Aristoxenos, as 'certus modus syllabarum quo cognoscimus totius metri speciem, compositus ex sublatione et positione.' Then, as the final item in his elucidation of the definition, he adds:

(7) Inter pedem autem et rhythmum hoc interest, quod pes sine rhythmo esse non potest, rhythmus autem sine pede decurrit. non enim gradiuntur mele pedum mensionibus, sed rhythmis fiunt. (P. 44 K.)

[1] Cf. Christ, Metrik, pp. 88–92.

As above, two senses of 'rhythmus' must be distinguished, namely, the abstract sense, rhythm, and the concrete sense, a combination of syllables or words constituting a "rhythmus." Thus in English paraphrase: "Between foot and 'rhythmus' there is this difference, that a foot cannot exist without rhythm, but a 'rhythmus' moves rhythmically without being divisible into feet." If one starts with the universal ancient idea of the foot, then *μέλη* in which a *συλλαβὴ τρίσημος* or *τετράσημος* often takes the place of the complete foot, not merely the end of a kolon but within it, obviously do not "advance by the measurements of feet," and the movement cannot be adequately described by naming the foot, or dividing it into feet. The rhythm of such a melic strophe is made up of "rhythmi." And in the first sentence of the passage (4) above our author is careful to say that "rhythmus" is a combination of feet and times, divided into arsis and thesis or time [the *χρονος πρῶτος*?] by which we measure syllables. Marius Vict. does not attempt to describe such *μέλη*, made up of "rhythmi;" he does not include them in his special field, but leaves them to the rhythmici and the musicians.

The section of Marius Vict. *de pedibus* (pp. 43–50 K.) is followed by the section *de metris*. The author is here considering in general terms the 'metra' that constitute his own field, leaving out of view the freer varieties of lyric. He begins by describing 'metrum' as a 'compositio pedum ad certum finem deducta seu dictionum quantitas et qualitas pedibus terminata vel rhythmus modis finitus.' Obviously 'rhythmus' here is not a piece of freer lyric, but simply a rhythmical composition in language, within the limits of the general class which he is here considering; he describes 'metrum' in three ways, after the

fashion common to this author, all three being substantially equivalent to one another. He proceeds: Prima autem metra sunt syllaba brevis et syllaba longa; ex his enim metimur ipsos pedes ac rursus ex pedibus metra et deinceps de metris carmina. Here 'metra' is employed in two senses, first in the general sense of measures, then in the technical sense of definite pieces of metrical (not freer lyric) compositions. Next are named four classes of 'metra,' namely 'epica, melica, comica, tragica,' which he goes on to describe. The description of the second class is interesting. It is, in full:

(8) Melicum autem sive lyricum, quod ad modulationem lyrae citharaeve componitur, sicut fecit Alcaeus et Sappho, quos plurimum est secutus Horatius. carmen autem lyricum, quamvis metro subsistat, potest tamen videri extra legem metri esse, quia libero scribentis arbitrio per rhythmos exigitur. (P. 50 K.)

Are we to suppose here an utter confusion of thought and terminology? That is surely incredible. But in that case the last sentence contains a pretty clear recognition of the fact that such lyric meters as those of the poets named occupy a peculiar position in relation to those two artificial classes, of 'metra' and 'rhythmi.' They are μέλη, they contain such mingling of prolonged syllables with feet of different γένη that the "metrical" ratio of 2:1 fails to account for the rhythm. On the other hand, they employ a comparatively small number of often repeated lines or brief stanzas, of fixed types; these can be accurately described and easily learned; the poet does not, like Pindar, or like the Attic dramatists in their lyric parts, disconcert the barbarian reader by inventing new forms and combinations for every new poem. This comparative fixity of type enables the metrician to include them under the 'metra'; yet our

author perceives that they are 'rhythmi' as well. A hard and fast line between the classes cannot be drawn.

There is also in Quintilian (IX, 4, 45–51) an interesting discussion of 'numeri' (here, as he explains, equivalent to 'rhythmi') and 'metra,' which traverses much the same ground; the difference in phraseology offers a good test of our interpretation. I select a few clauses only. 'Although both consist of feet, yet they differ in several ways. Nam primum numeri spatio temporum constant, metra etiam ordine, ideoque alterum esse quantitatis videtur, alterum qualitatis.' That is, in a 'metrum' the sequence of feet, syllables, and times is fixed; the poet was not free to vary these, except within very narrow limits; while in writing 'numeri' great freedom was allowed, if the due 'spatium temporis' was observed. A little later he proceeds:

(9) Sunt et illa discrimina, . . . quod metrum in verbis modo, rhythmos etiam in corporis motu est. inania quoque tempora rhythmi facilius accipient, quamquam haec et in metris accidunt. maior tamen illic licentia est, ubi tempora etiam [animo] metiuntur et pedum et digitorum ictu, et intervalla signant quibusdam notis atque aestimant, quot breves illud spatium habeat; inde *τετράσημοι*, *πεντάσημοι*, deinceps longiores sunt percussiones, nam *σημεῖον* tempus est unum.

Especially noteworthy is the plain statement that rests ('inania tempora,' *κενοὶ χρόνοι*) occur in 'metra,' though naturally more freely in 'rhythmi,' where the performer or leader beats time, and where the composer adds, if necessary, signs that indicate the longer time-intervals.

Still another remark of Marius Vict. farther sets forth his view of 'rhythmi' or *μέλη*.

(10) Hinc procul dubio intelligi datur prosam numeris

subsistere. nam et Aristoteles, homo sublimis ingenii, praecipit numeros esse in oratione oportere, ita tamen ne versus incurrant, qui saepe imprudentibus subrepunt, quod et Cicero in Oratore suo tangit, ipsa quoque lyrica poemata sublata modulatione vocis non ultra solutam orationem procurrunt. (P. 113 K.)

This passage immediately follows that quoted above (p. 35) on the pentameter, to which 'hinc' refers back. Each paragraph throws light on the other; and if the reader desires to see them in their true relation he will do well to turn to them in Keil's pages. I take this meaning to be clearly involved in them. In the illustrative pentameters which Marius Vict. has just given a certain slight degree of 'modulatio' or *πλάσμα* is requisite in order to produce the verse; without that they are prose, containing 'numeri' indeed, but not making, to his ear, a true 'versus.' This enables us to see beyond question, he says, how prose should contain (as Aristotle and Cicero direct) 'numeri' but not 'versus.' Again, even lyric poems (that is *μέλη*), like the pentameters quoted, if you take away that still higher degree of 'modulatio vocis' (that is *πλάσμα*, the more exact observance of rhythm that goes naturally with the singing voice), become in their movement nowise different from rhythmical prose. In other terms we might say: the *συλλαβαὶ τρίσημοι* and *τετράσημοι* of the full musical rendering are in such "unmodulated" rendering not fully preserved; pauses and shifts of rhythm take their place in a degree sufficient (the degree need not be great) to obscure the full musical rhythm, and change it to the less consistent rhythm, more shifting and less easily noted in exact ratios, that pleases in good prose. For the sake of the little additional light on this matter of *πλάσμα*, the following is added from Aristides Q.:

(11) Ῥυθμὸς δὲ [νοεῖται] καθ' αὑτὸν μὲν ἐπὶ ψιλῆς ὀρχήσεως, μετὰ δὲ μέλους ἐν κώλοις, μετὰ δὲ λέξεως μόνης ἐπὶ τῶν ποιημάτων μετὰ πεπλασμένης ὑποκρίσεως, οἷον τῶν Σωτάδου καί τινων τοιούτων. (P. 32 Mb.)

That is (taking into account the context): "Rhythm without tune or words is perceived in unaccompanied dancing; combined with tune it is perceived in passages of instrumental music; combined with speech alone, in poems declaimed with a 'moulded' delivery, as those of Sotades and the like." The degree of πλάσμα here intended need not be very great. Presumably it would be about what we are all accustomed to in public recitation of poetry; such a degree as Probus had in mind in saying: Item Aeneida quoniam plasmate legi volebat, ait "arma virumque cano" (cited by Keil on Atilius Fort., p. 282 K.). That is, we are not to suppose that πλάσμα implied great artificiality or extraordinary prolongations and contractions. The phenomenon thus named is one perfectly familiar to us in modern speech and verse, as we shall have occasion to note in the next chapter.

One more passage is worth citing here, though it deals with the contrast, not between 'metrum' and 'rhythmus,' but between prose and 'rhythmus.'

(12) Ἡ μὲν γὰρ πεζὴ λέξις οὐδενὸς οὔτ' ὀνόματος οὔτε ῥήματος βιάζεται τοὺς χρόνους οὐδὲ μετατίθησιν, ἀλλ' οἵας παρείληφε τῇ φύσει τὰς συλλαβὰς τάς τε μακρὰς καὶ τὰς βραχείας, τοιαύτας φυλάττει. ἡ δὲ ῥυθμικὴ καὶ μουσικὴ μεταβάλλουσιν αὐτὰς μειοῦσαι καὶ αὔξουσαι, ὥστε πολλάκις εἰς τὰ ἐναντία μεταχωρεῖν. οὐ γὰρ ταῖς συλλαβαῖς ἀπευθύνουσι τοὺς χρόνους ἀλλὰ τοῖς χρόνοις τὰς συλλαβάς. (De Comp. Verb. 11, p. 134 Sch.)

The first sentence of this touches a matter to be considered later; its value at present lies in the force given

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by contrast to the remainder. And in that, the two remaining sentences, we find ample recognition of the fact that in Greek lyric meters, so far as they come under what we have seen called *μέλη* and *ῥυθμοί* or 'rhythmi,' long and short syllables alike were more or less variable. In some way — just how, we will not yet consider — the reader knew in what rhythmical scheme or pattern the poet intended the verses to be rendered. To reproduce the rhythmical pattern which the poet had in mind, the singer, if not also the reader, made some long syllables longer and others shorter than two *χρόνοι πρῶτοι*, and made some short syllables longer than one *χρόνος πρῶτος*. It seemed to Dionysios in those cases that one did not so much regulate the times by the syllables, but rather regulated the syllables by the times. It is highly probable that Dionysios here draws from some earlier writer; but whether he does or not, we cannot suppose that in the time of Augustus such statements, by a man like Dionysios, are in any degree suggested by a breaking down of the sense for the classical quantities. On the other hand, the following contains an unmistakable reference to the medieval and modern principle.

(13) Metrum poeticum quid est? versificandi disciplina certa syllabarum ac temporum ratione in pedibus observata. metrum unde dictum? quod veluti mensuram quandam praestituat, a qua siquid plus minusve erit, pes sive versus minime constabit. metro quid videtur esse consimile? rhythmus. rhythmus quid est? verborum modulata compositio non metrica ratione, sed numerosa scansione ad iudicium aurium examinata, ut puta veluti sunt cantica poetarum vulgarium. rhythmus ergo in metro non est? potest esse. quid ergo distat a metro? quod rhythmus per se sine metro esse

potest, metrum sine rhythmo esse non potest. quod liquidius ita definitur, metrum est ratio cum modulatione, rhythmus sine ratione metrica modulatio, plerumque tamen casu quodam etiam invenies rationem metricam in rhythmo, non artificii observatione servata, sed sono et ipsa modulatione ducente. (Ars Palaemonis de Metrica, p. 206 f. K.)

The clause 'ut puta veluti sunt cantica poetarum vulgarium' leaves no doubt what 'rhythmus' refers to in this little dialogue. Though the form of statement is influenced by the older doctrine, exhibited in the extracts preceding, what is here contrasted with 'metrum' is not the old μέλη, the "rhythmi" of Marius Vict., but the modern songs of the poets of the people. We have reached now a new meaning of 'rhythmus' and 'rhythmi,' the medieval usage. To the new style of accentual Latin verse the term 'rhythmus' was now applied, in contrast with the old quantitative verse, or 'metrum.' This interesting subject falls outside the scope of these chapters: it is the central point in Kawczynski's book, before cited, where it is discussed at length (p. 115 ff.) and other testimonies collected.[1]

Through the foregoing survey, if our metrical friends have been rightly interpreted, we have arrived at some conclusions that are of value for farther investigation.

First, contemptuous rejection of clear and consistent teaching of the metrici is unwise and likely to lead astray. Sympathetic study is not thrown away on them, even the most foolish of them. They are sometimes inconsistent with one another and with themselves; sometimes it can be proved beyond a doubt that one is wrong;

[1] Kawczynski's chapters, IV–VI, traverse in part the ground gone over in the preceding pages. They show much acuteness, but also too large an admixture of error.

in that case we need not treat his mistake as anything else than what it is. But not a little which has been called nonsense is really very good sense when understood. Westphal long ago noted how remarkably some of the very latest among them have preserved for us good and sound doctrine from an early period. By the fourth century B. C. there was already in existence a large body of well settled metrical tradition; each new writer varied this more or less, but in general it was handed on from generation to generation with little change, the agreement often extending to small verbal details. Our school-books on arithmetic, or on grammar, are fair modern parallels; textbooks of geometry and of logic have come down in a similar way from antiquity, remaining in current use, without being affected in any degree that could be called transforming, until quite recently. That long transmission of a large traditional system makes the study of sources for any given handbook both enticing and exceedingly slippery.

Secondly, we must not expect to find in the metrici adequate explanation of the more complicated and difficult lyric meters. They left that, consciously and on principle, to others, and restricted themselves in general to meters which they were accustomed to read and to hear read and recited. These they treated with little or no reference to the actual times of syllables, when the ratios were something else than the conventional 1 : 1 and 2 : 1. For the melic rhythms in general, particularly the freer forms, we have to fall back on Aristoxenos, and interpret by him the descriptions and scattered hints supplied by the metrici. If a real contradiction is found between him and the latter, we can but follow Aristoxenos as the better guide.

Finally, the teachings of the metrici cannot be accepted

without caution; we must first of all exercise the utmost care to discover the precise sense intended. Their standpoint, while natural and rational, was different from that of Aristoxenos; the same facts, viewed at such different angles, and then stated in terms that bore a partially different meaning in the two systems, are not always easily recognizable as the same. Their method, while not seriously defective for their purposes and their contemporaries, is for us defective and apt to mislead, even in regard to recitative verse. If we would keep our minds clear in regard to rhythm in language, we must go back of the syllable and keep steadily in view always the time, the time-intervals, and the combinations of time-intervals, embodied in the words. What we seek is the actual rhythms of ancient verse, as these reached the ear and moved the soul of the Greek listener; to that end alone are the old metricians worth our study. The end is worth a great deal, and is difficult to attain; therefore anything, in methods of study or of presentation, that hinders its attainment should be put aside, and the end should be sought in the most direct way. Now the methods that specially characterize the metrici, as against Aristoxenos, though probably not a hindrance to the mass of their contemporaries, are to us a hindrance; to us they often do not state the facts without frequent, and frequently changing, reinterpretation of their form of statement into another form. Here is a constant source of difficulty and of tendency to misunderstanding, not only for beginners, but also, as we have seen, for well trained Hellenists and even specialists in metric. Keeping in view the real facts of rhythm, as the verses fell from the lips of the ancient reader and singer, we should make our terminology and entire mode of statement conform to those facts and present them as directly

as possible, with the minimum of ambiguity or of necessity for reinterpretation. Therefore in describing even the simplest meters it is better to employ every available device for enabling us to say exactly what we mean. It is better not to say spondee when we mean an irrational trochee, and then again speak of the middle spondee of the elegiac pentameter when we mean a tetraseme plus a two-timed long; and so in other cases. In writing metrical schemes the marks for long and short alone add nothing, in themselves, to the rhythmical notation contained in the words. The ancients employed, when they needed them, precise terms and unambiguous signs for triseme, tetraseme, rests, the location of the down- and up-beat. We need these constantly and had better use them, though the metrici did not. We need also an unambiguous sign for an irrational syllable; the sign > has been widely adopted for that purpose; it is better to use it than either to invent another or to go without any. In all these matters the utmost precision in recording and describing rhythms is none too great.

Yet one more point. In the study and teaching of the other aspects of language we have taken what the Greeks taught us, and after mastering their facts and their system of statement we have gone beneath and beyond the ancient system, not hesitating to recast it completely, bringing to bear on the subject not only many new phenomena but also an improved method which the Greeks could not know. All departments of grammar are still undergoing that recasting process. The same process — though perhaps in less degree — is naturally to be expected in the study of this aspect also of the Greek language. I have sufficiently emphasized the point that the first step in that process must be the more complete mastery of the ancient learning. But we

should no more expect to stop with that than we expect to stop with the ancient learning in morphology or syntax. And the line of advance toward this desideratum, a better and fuller knowledge of the rhythms of Greek poetry, and a knowledge arranged in a better system, lies along the path opened by Aristoxenos.

III

RHYTHM AND LANGUAGE

No better definition of rhythm has been given, or need be sought, than that of Aristoxenos, *χρόνων τάξις ἀφωρισμένη*, temporum inter se ordo quidam, a definite arrangement of times. This is probably the earliest, certainly the most widely current, technical sense of *ῥυθμός* among the Greeks. When they called a statue *εὔρυθμος*, or said that a person walked *εὐρύθμως*, and the like,[1] these were probably figurative applications of the technical term; though it is true such uses may have been independently developed from the early meaning, order, or law, which the word has in the line of Archilochos,

γίγνωσκε δ' οἷος ῥυσμὸς ἀνθρώπους ἔχει.

The essential identity and the specific characteristics of rhythm in many activities of life, nature, and art were accurately noted and described by Aristoxenos. It is the more to be regretted that many people — more especially in English-speaking countries — whose studies have not familiarized them with this department of Greek science, still use the term, and even define it, in a loose, confused, and utterly unscientific way. Particularly on the subject of modern verse we too often hear and read statements which their authors could not possibly have made, had their minds been clear as to what rhythm is. In all such technical discussion no other

[1] Aristid. Q. I 13, p. 31 Mb.

sense of the word rhythm should be for a moment admitted than that so clearly laid down by Aristoxenos.

It is an aid toward precision of thought to hold fast an accurate idea of the relations, both of analogy and of contrast, between rhythm in time and symmetry in space. As to the latter, there is little danger of confusion. What presents itself to the eye primarily and constantly, and is by nature more abiding, is more easily grasped and more readily becomes in correct form a part of the unconscious mental outfit; rhythm presents itself most often to the ear, and whether heard or seen, it is by its nature temporary and unstable, a series of phenomena in unceasing flight. We may call symmetry a due proportion, in relation to each other, of the parts of something in space. Absolute equality of parts is not essential; but approximate equality or easily discerned simple ratio, of extent or of effect upon the sight in the larger parts, is essential. Starting from this idea we might describe rhythm as due proportion, in relation to each other, of the parts of something in time, — or more abstractly, as due proportion in time-intervals. This description is correct as far as it goes, but is defective, because it omits one element. This element is due to the difference between space and time, and to the limitations of our senses. Due proportion of parts is perceived in space when the parts are few, — is perceived best when the object readily divides itself to the sight into halves, as a leaf, or the human figure in a front view, so that the main parts are but two, within which the minor parts may, without confusion and with increased pleasure to the spectator, bear to each other proportions very complicated. The parts exist contemporaneously; the symmetrical whole commonly remains under observation unchanged for some time; thus the

mind is able to grasp, and to analyze in detail if it will, extremely complex relations of space in the parts, provided those main groups of parts are plainly marked, and are but few, preferably two. In time, however, due proportion of numerous parts is not perceived so readily, if at all, unless the number of distinctly marked groups is larger, extending to at least three, preferably more. No two groups of times, no two parts of the smallest time group, are contemporaneous, or can remain under contemplation together except in the memory. Hence repetition is necessary. An amount of repetition which in space would seem monotonous, or at best an example of very simple art, does not seem so in time, but aids the memory and gives pleasure. The form of symmetry that is most closely analogous to rhythm is that of a long, narrow and not too intricate pattern consisting of a short pattern many times repeated. Examples are the meanders, the lotos patterns, the egg-and-dart mouldings and other ornamental bands so frequent in Greek art, or our edgings of lace and embroidery, and ornamental bands and borders in general. The rows of figures around a dipylon vase are still within the requisite limits of regularity; those of the François vase are too free. The alternating triglyphs and metopes of the Parthenon are a fine parallel; the Panathenaic frieze lacks the needful articulation. An arrangement of times that should be analogous to the symmetry of a fine pediment composition, or to any of the painted groups in the Sixtine Chapel or the Stanze of Raphael, would never be recognized as rhythmical, unless at the same time there ran through the whole, comprehending all the parts, a simpler system of grouping, analogous to that of the meander. An ode of Pindar, or a movement of a symphony, is held together and unified by the

repetition of a small group of times, the measure or foot or the like; on that substratum, out of that continuously repeated though varied small group, are formed, by the aid of recurring variation in time and melody (and in Pindar of the dance), concepts of larger and yet larger groups, until, by repetition of groups both smaller and larger, the senses are sufficiently impressed to enable the memory to retain and the mind to comprehend a notion of the whole as one. To such a work a good parallel — comparing, of course, only the rhythm of one and the symmetry of the other — is a fine oriental rug of rich pattern and coloring. Yet it has been well noted that a complex work of art in space, particularly in three dimensions — say a temple or a statue — is not wholly unlike a complex piece of rhythm, as regards our method of acquiring an idea of the whole. In both memory has something to do, for the eye does not see all parts at once; after viewing a statue or temple from all sides, and a temple from the inside as well as from without, the various parts in temporal succession, the unifying must then be done by the aid of memory, as in the case of rhythm. But though this is true, yet in successive viewing of parts the time element and the consequent agency of memory are so much less fundamental than with a work of rhythm, that the resemblance has little effect in diminishing the great practical difference.

One other factor in the definition of rhythm must be insisted on, though it is tacitly assumed in the foregoing illustrations. The simple repetition of equal undivided and undifferentiated time-intervals does not produce rhythm. There must be a τάξις, an arrangement of times *inter se*. An unchanging single drum-beat recurring every two-thirds of a second would produce nothing

but a succession of equal times, though experiments have shown that the great majority of listeners would involuntarily imagine some difference between the sounds or the intervals, and so by a purely psychological process would differentiate the times, group them, and imagine a rhythm where objectively there was none. But if in that succession of unchanging drum-beats, beginning anywhere, you omit the second, fourth, and eighth, you will make a grouping of times; that series repeated is our simplest drum-rhythm for marching. The action of walking, in which the feet alternately are lifted, moved forward, and placed, with endlessly various play of muscles, produces another grouping, extremely complex to the eye and to the muscular sense of the walker, though to the ear, when audible at all, a rather simple one. This necessity of a τάξις in rhythm is the more to be insisted on because many writers on modern verse-rhythm ignore it.

In recent years rhythm has been, and continues to be, the subject of many-sided investigation. Physicists and naturalists of every sort have been compelled to take large account of this factor in the phenomena of nature. Periodicity, always obvious to man in the procession of the seasons, in the lunar phases, in the alternation of day and night, is discovered to characterize about every kind of motion and change that the student of physics can measure. The periodicity of astronomical and inorganic forces is reflected in the life of plants and animals of every grade, in health and in disease. The physiological rhythms of respiration and the heart's beating are but types; in all vital processes biologists find similar laws. The simplest cell, whose growth can be followed only under the microscope, is subject to them, no less than the highest animal organism. Psychologists, too,

find that all the activities of the human mind exhibit rhythm in great variety; there is a constantly lengthening series of special investigations along this line. This is not the place to recapitulate these studies of rhythm,[1] so numerous and so various, nor even to summarize their results. But without some realization of the extent to which rhythm pervades the kosmos, including the unconscious life of man, one is liable to approach the subject of rhythm in language with prepossessions so deep-rooted that argument on some points will be wasted.

In harmony with the unconscious, involuntary rhythms of the human organism, in part certainly and perhaps wholly the consequence of them, is the fact that rhythm in the broad sense pervades also all of man's conscious and voluntary action. Alternating exertion and repose, tension and relaxation, is a law of the life that is regulated by will, from the larger tasks and recreations to the movement of the smallest muscle. But for our purposes this broader sense of the term must be narrowed. We are concerned only with forms of rhythm in which the lesser time-intervals that make the larger pattern are comparatively short. Absolute limits can hardly be given; but experiments appear to show that if the shortest unit is as long as two seconds, the mind does not coördinate the intervals and group them distinctly enough to be conscious of a rhythm. On the other hand, if the intervals are too short the mind does not separate them; they run together instead of forming groups; but of course continuous tones that vary regularly in pitch or intensity, or continuous movements that regularly change their direction, may by those regular variations divide

[1] See Bolton, Rhythm, in Am. J. Psych., VI, pp. 145–238; Wundt, Völkerpsychologie, Ch. VII; Studies from Yale Psych. Lab., IX.

time into intervals that fall within the necessary limits and are perceived as a rhythm.

Now the fundamental fact, for our present purpose, is this. All activities of man that are regulated by his will he puts into a perceptible rhythm, so far as they admit such treatment without violating requirements that to his mind take precedence. Man is not merely a rhythmical animal, as all animals are; he is a rhythmizing animal, as truly as he is a political animal. As men tend to unite into political communities, so the individual tends to rhythmize everything that he comfortably can. This tendency is not simply a matter of musical endowment, possessed by some and not by others; it controls more or less fully every human being, generally without his being aware of it. The individual merely acts in the way that he finds easiest or most natural; and he acts in rhythm. There are said to be people who cannot keep step to a drum, or with a companion; if so, the defect is in the power of coördinating their action with something external, with a rhythm set by something from without. But even one who has that defect makes no end of perfect rhythms of his own. He makes his own steps equal, or if unequal then regularly unequal; if he drives a nail or curries a horse or rows a boat or chews his food or drinks a glass of water, he makes as good rhythms as any one else. The tendency appears to be absolutely universal; the only difference between people in this regard lies in the degree of consciousness of the rhythm one is producing, and the consequent power of controlling and consciously varying the rhythmic movement. There, it is true, people differ very much, and still more in the power of isolating and describing rhythms which they make or see or hear. But that does not affect the truth of the statement just

made. It is a universal law that man is a creature who rhythmizes, in the strictest sense given to the term, every kind of action that admits of it. Men differ a good deal in capacity for acquiring languages, much more in capacity for teaching them; but all men not physically defective are endowed with speech, and speak the language they have heard from infancy. The rhythmizing impulse is no less universal than speech.

Plato recognizes, putting it in his mythological way, the inborn character of the rhythmic sense, and the wide separation in this matter — even though it should prove to be a difference in degree only — between man and the other animals. "Young creatures cannot be quiet in their bodies or their voices; they are always wanting to move and to use their voices, now leaping and skipping, as it were dancing with delight, and now making all sorts of cries. But while the other animals have no perception of order or disorder (*τῶν τάξεων οὐδὲ ἀταξιῶν*) in their motions — that is, of rhythm and melody — to us the Muses and Apollo their leader and Dionysos have given the perception, accompanied by pleasure, of rhythm and time." (Laws 653 d–654; also 664 e.)

Aristotle also (Poet. 4) counts rhythm and imitation as equally *κατὰ φύσιν*; in the Aristotelian *προβλήματα* (920 b; p. 98 v. Jan), in answer to the query why all delight in rhythm and song, it is remarked that they are *κατὰ φύσιν*, and that infants delight in them from the beginning. Some of the common rhythms of every-day life also were noted by Greek writers. We find Aristides Q. (I 13) citing the pulse-beats as an illustration of the rhythm perceived by the sense of touch. Longinos on Hephaistion (p. 84 W) refers to the sound of blacksmiths' hammers, the walking or galloping of horses, the movement of fingers, the flight of birds.

Probably all these examples were taken from Aristoxenos. The first words in our longest fragment of his ῥυθμικὰ στοιχεῖα are: "Οτι μὲν πλείους εἰσὶ φύσεις καὶ ποία τις αὐτῶν ἑκάστη καὶ διὰ τίνας αἰτίας τῆς αὐτῆς ἔτυχον προσηγορίας καὶ τί αὐτῶν ἑκάστῃ ὑπόκειται, ἐν τοῖς ἔμπροσθεν εἰρημένον. νῦν δὲ ἡμῖν περὶ αὐτοῦ λεκτέον τοῦ ἐν μουσικῇ τατταμένου ῥυθμοῦ. (P. 266 f. Mor.) The preceding book, then, had included some discussion of the different kinds of rhythm outside of the arts. Their natures, the underlying material of each, the various applications of the word ῥυθμός, had been sufficiently set forth to clear the way, and enable him from this point on to consider the rhythms of art only. There was the natural place for such examples as the above, which we may be pretty sure were introduced into the text-books by no later rhythmicus.

Any observer today may find innumerable other examples from the whole range of voluntary human action. The child prefers to skip and dance along rather than walk; the rhythm is less monotonous and more pleasing. Little girls jumping rope like to vary the steps; the boy's hop, skip, and jump is better fun than plain jumping. A butcher's boy chopping meat on a block does away with monotony and gets a touch of art into his task by playing whole drum-tunes with his two heavy cleavers. Such are the skeleton tunes played by a drum-corps, with no instrument to furnish the melody, — like the shadow picture which the X-rays make of a human hand. In the household, beating up an egg, rubbing clothes on a washboard, moulding bread, paring apples, shelling peas, — all alike tend to fall into longer or shorter periods of distinct rhythm, different for each kind of task, but pretty constant for any one kind in the hands of the same person. The operations of the shoe-

maker, the joiner, the coal-heaver, the stevedore, exhibit the same tendency, so far as their nature permits, and are appreciably lightened thereby.

Such observations have led to extended study of like phenomena. Prof. Karl Bücher, approaching the subject first from the standpoint of his own department of study, economics, soon saw that other sciences, as physiology and psychology, must also be called into council, while the subject bore directly on the origin and development of several of the arts as well. His book, Arbeit und Rhythmus,[1] contains a mass of material of great value for the student of popular music and poetry. For metric Bücher's results are all the more valuable because reached by a trained scientific observer from another field — one who is both competent and at the same time quite free from the prejudice of a preconceived metrical theory. Bücher takes into view not only the familiar trades and occupations in modern civilized communities, but also and more particularly those of savage, barbarian, and semi-civilized peoples, of tribes in those more primitive stages of development through which our ancestors have passed. By evidence from the most widely distant sources it is shown that nearly all the work of primitive man is carried on in rhythm. When performed with hands and feet alone or with simple tools, many bodily movements are required for moderate results. The repetition of such simple movements unconsciously, — but of course originally by the exercise of will, — becomes rhythmical and thereby easier, pleasanter, and more productive. Many movements — like stamping, beating, pounding, grinding, rubbing, throwing the shuttle, mowing, winnowing grain by hand — produce a sound, or more than one kind of sound. These success-

[1] 2te Aufl., Leipzig (Teubner), 1899.

ive sounds divide time to the ear also, though in such cases the source and permanent regulator of the rhythm is not the sound but the muscular movements. To these movements and sounds a song is often joined, — with the more primitive workmen nearly always. The words may be very simple, perhaps nothing more than inarticulate cries, often nearly or quite nonsense; often on the other hand it is an intelligible piece of verse, its subject more or less closely connected with the work. The tune also varies from the simplest, hardly to be called musical, to a folk-tune that a musician's ear is pleased with. The song observes the same rhythm with the work, which regulates it, and at the same time is furthered by it. The additional expenditure of energy is overbalanced in effect on fatigue by the pleasure and stimulus. Bücher gives the words and music for a large number of these work-songs from all quarters of the earth. Especially noticeable is the rhythmical form, and the effect of such rhythmizing of work, when two or more work together. The rhythm of labor, often with song, is then not only regulative for the individual, but it becomes a means of coördinating several workmen. That is particularly the case when the work demands coöperation, and that in various ways. The simplest kind of such effect is seen when sailors hauling on a rope utter a rude call which is hardly song, but which marks the time for tension and relaxation of effort, and so enables all to apply their strength at the same instant. The stimulus of rivalry is often thus introduced, as in the case, once familiar in many lands, of a company of mowers or reapers. One leads off, the next tries to keep as near him as possible, in order not to seem inferior to the first and not to be caught by the third, who is pressing on behind. The leader too has his pride in being foremost, and will set

a good pace, to the notable increase of results. Among the peasants such tasks were once generally accompanied by mowing and reaping songs. Boat songs are a well-known example of the same thing. Our old triad of the dance, poetry, and music wears many forms but is easily recognized.

A few words on the question of the regulator in the triad. With his eye on the labor primarily, Bücher sees in that — correctly enough, so far as the united triad in his examples goes — the central thing to which the rest conforms. But we need to look more closely at the vocal element. Obviously tune in itself has no content of alien nature, that limits in any way the duration of the single note; an essential quality of purely musical sound is that it be prolongable at pleasure, within the capacity of the instrument. So far as the vehicle of the tune is a vocal utterance devoid of all non-musical meaning, inarticulate or mainly of the vowel character, there is nothing outside of the motions involved in the labor (and of course the capacity of the vocal organs, particularly the breath) to limit the duration of each note and regulate the rhythm. But when, in place of such vocal sound, true words are employed, another element comes in. The words did not originate in the work. They are brought to it from without, already possessing certain firmly inherent qualities derived from a multitude of other uses and associations. Among those inherent qualities is a more or less definite meaning, no more affected by its employment in a work-song than by its employment in any other context. Inseparable from the meaning and equally inherent, in all languages, is a more or less definitely fixed relative duration of the syllable in comparison with adjacent syllables. Misunderstanding is here easy; let me make

it as difficult as possible. First by exclusion. Some words of a simple phonetic character, expressing emotion mainly, retain always the capacity of almost indefinite prolongation that belongs to purely musical or inarticulate vowel sound. Words like ah! whew! are not distorted in the least by a lengthened pronunciation in a sliding tune; such utterance merely increases, while it may more closely define, the emotional expression. In phonetic and semantic character such words approach purely musical sound, and naturally approach it in their treatment as regards duration. For the moment leave these words aside. With them are to be placed a few exclamations, not so simple phonetically, which originally had a more intellectual semantic content, but which in use have been largely stripped of that and now are merely expressions of emotion, like those in the former class. Such are many exclamations like gracious! mercy! or *Herr Je!* Again, in loud calling to one at a distance, a simple phrase, or the last syllable of a name, may be likewise prolonged, in a manner that in other circumstances would be an inadmissible distortion. The need of making the sounds carry an unusual distance, or against unfavorable conditions, we accept as excusing what we all nevertheless feel to be abnormal though not uncommon. Once more, in modern singing we accept now as a matter of course, for the sake of the musical effect, extraordinary prolongation of vowels. We allow the composer to subordinate the word-form, and the meaning of the words in detail, absolutely to his musical idea. Handel's oratorios exhibit this in extreme degree. But all will admit, I think, that this is a special case hardly bearing on our present problem. It is a consequence of the extraordinary modern development of music, quite foreign to antiquity, and held within pretty

strict limits in real folk-song, even that which arises now among a people largely influenced by the more freely developed art. This too, then, may be excluded. Putting these cases aside, the principle asserted is this. Even in a language whose syllables are so elastic as in English, there are limits of relative length, narrower than those fixed by the organs of speech or the duration of the breath, to exceed which in speech or in artless song — that is, in song not composed by one well schooled in the specifically modern developments of music — appears unnatural, a distortion of the word, and is therefore not admitted, except for a distinctively comic purpose. The fact seems indisputable when we follow in thought the rise of one of these work-songs. When words with a definite meaning are made to accompany the worker's motion, in order to fit the rhythm in a way to satisfy the worker they must have been selected with some reference to those "natural" — that is, previously and elsewhere determined, however elastic — limits of relative duration in the syllables. In languages employing a marked stress as word-accent, that element too must be regarded; a syllable that in the same context would receive when spoken a markedly stronger stress is not in satisfactory harmony with the work-rhythm, if so placed as to accompany the weakest muscular tension. I trust the point is clear. While it is true that the rhythm of the work-song is primarily determined by the work-rhythm, the words also possess, before being selected and placed in the song, inherent qualities of syllabic length, perhaps stress too, such that the completed specific combination of words naturally carries the same rhythm independently, when dissociated from the work, and even to those who have forgotten or never knew the work-rhythm in itself, provided they know

the language. The work-rhythm leads the worker to create a parallel rhythm in another medium; the second ῥυθμιζόμενον is of such character that its rhythm is perfectly preserved by it independently. Of course this is true in a degree slightly varying with individual cases. As the verbal rhythm is in the worker's mind secondary, it is not always perfected in every detail; but as the words become more important to him, the inclination is stronger to make their rhythm more independently clear. With a view to the farther course of this chapter it seemed necessary to put this relation between the words and the rhythm beyond question.

The following summary I quote in substance from Bücher (p. 357 ff.). "In that center of convergence we see work still undistinguished from art and from play. There is a single human activity, a solution of work, play, and art. In this unity of physical and mental action we perceive the germs of development along all those lines. . . . The arts of motion (music, dance, poetry) come into being in the performance of work; the arts of rest, of form, are embodied, if only in the form of ornament, in the results of work. This is all simply the instinctive action of life in common, average humanity, — in savages, in peasants, in working people. The bond that holds together these elements, which we have come to think so unlike, is rhythm, whose source is in the very essence of the human organism."

Allied to the work-song and a little nearer to our goal are verses that children recite or sing in connection with play. Great numbers of these are current, probably in all languages in which children enjoy games together. They are handed on almost purely by oral tradition, many of them from one child-generation directly to another, or rather from slightly older to

slightly younger children joining in the same game; parents who have forgotten them discover suddenly that their children are reciting them. Others are used by parents and nurses to amuse infants. Some are very old, existing in many versions. I will cite only a few, quoting, if at all, in the exact form that was familiar to my childhood.

Counting out rimes[1] are generally doggerel. One child "counts out" by repeating the words, pointing in succession to all around the circle, to a new individual with every heavily stressed syllable. The person pointed at on the last syllable of the stanza, always a stressed syllable, is "out"; the operation is repeated with the rest, until only one is left, who is "it." The rhythmic pointing is a sort of beating time; the stressed syllables recur at equal intervals; between them may be one or two syllables or none. No attentive onlooker can fail to distinguish, whether he can describe it correctly or not, the very exact rhythm.

The following is a verse that may sound like nonsense, but which still had a very distinct and agreeable meaning to many New England country families thirty-five years ago.

Bean porridge hot,
Bean porridge cold,
Bean porridge in the pot
Nine days old.

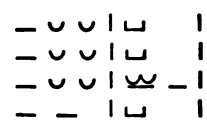
This was accompanied by a play, which must be described in full. Two persons are seated face to face and close together; while the words are repeated by both or by one alone, both make the following movements.

[1] See H. C. Bolton, Counting out Rhymes of Children, London, 1888.

Bean — each person slaps both palms on his own knees;
por — both palms together;
hot — both palms against partner's, right against left, left against right;
Bean porridge cold — same play repeated;
Bean porridge — as before;
in — right palm against partner's right;
pot — both palms together;
Nine — left palm against partner's left;
days — both palms together;
old — both palms against partner's as on *hot*.

[Then repeat ad libitum.]

The louder the slapping noises the greater the fun; generally the speed would be gradually increased until one or the other made a mistake. The rhythm of the play is sharply marked, and the words being well known were often not recited aloud, merely running along in the mind of the players to help them keep the order of the changes. And on the other hand the rhythm of the words without the play is just as distinct and unmistakable. They were often recited alone; there could be no better illustration of perfectly independent but parallel rhythms in two different mediums. Neither regulates the other. Which was the original one, which secondary? No one can say; but as the words have an independent meaning and the play has not, I should guess the word-jingle to have been first invented. And the rhythm is plainly this, expressed in metrical symbols:



The symbols are intended to indicate merely the time-intervals and their arrangement. Where two are written the upper indicates the intervals marked off by the syllables, the lower those marked off by the play. So written the word-rhythm appears a trifle more varied than the play-rhythm; but that is merely because the symbols fail to note some of the changes of the play. In fact the four hands in alternating pairs, now against each other and now against the knees, make a rhythm that is rather complex. The hand-rhythm alone is indeed threefold, according as it is perceived by the muscular sense, the ear, or the eye. In like manner that of the words is twofold; no symbols have been invented that really represent more than the larger divisions. In the words each distinct time is marked by the beginning of a syllable, or by the transition from one syllable to the next; more precisely by the beginning of the vowel of each syllable. The word-accent is prominent as a strong stress on the vowels of the more important intervals; stress on the first syllable of *porridge* and on *days* is slightly subordinated; that of *in*, which is not in itself a strong word, is treated in the rhythm as equal to those that would ordinarily be considered heavier. Whether the words *hot*, *cold*, and *old* really fill the whole interval (except for a minute fraction required for the break in sense), or whether they occupy but half, the remainder being left vacant, one may feel uncertain. At first thought one would say the latter; but closer observation, and examination of gramophone records, incline me decidedly to the former explanation. Rhythmically it makes no difference which; in either case the whole interval from the beginning of the syllable to the beginning of the next is the same; and that is what the rhythmic sense takes account of. In the play each

distinct time is marked at its beginning by audible contact of the palm with the knee or another hand; the rest of the interval is to the ear vacant, to the eye and muscular sense it is filled out by the bodily movements. The close of the last interval is unmarked; the unconscious arithmetician in us merely assumes it. Still farther, the intervals fall into a complex grouping. In the words each line is a group, the first and second together are a larger group, as are the third and fourth; rimes are one sign of this, but the variations of times, apart from the rime, would alone suffice to group the whole in the same manner. The same grouping appears in the play as well. So far in this description technical terms have been avoided, but it is quite clear that the rhythm is what the Greeks called dactylic, in what musicians now call common (or perhaps $\frac{2}{4}$) time. Each foot or measure is a dactyl or its equivalent; the single intervals are of three magnitudes, standing to each other in the ratio of 1, 2, 4; in the terminology of Aristoxenos the *χρόνοι ποδικοί* are the *χρόνος πρῶτος*, *χρόνος δίσημος*, *χρόνος τετράσημος*. The entire *περίοδος* consists of four *κῶλα*, grouped by twos, each *κῶλον* being a dipody.

There is a little three-part round that is often taught to companies of older children. It has doubtless been printed, but I do not remember to have seen it; it lends itself easily to the Greek method of musical notation, as the rhythm of the melody is that of the words, only more exactly observed. Placing above the several syllables the letters that indicate the notes of our scale (the middle octave in capitals, A–G, the next above in small letters), it runs, in the key of C, as on the opposite page.

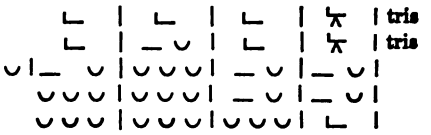
In reading the words quietly, without *πλάσμα*, there are places where the rhythm may be doubtful. Some

E D C
I. Three blind mice; [thrice]
G F F E
II. See how they run; [thrice]
G c c ba b c G G
III. They all ran after the farmer's wife;
G c c c b a b c G G
She cut off their tails with a carving knife;
G cc c b a b c G G G
You never did see such a sight in your life.

[Repeat ad libitum.]

phrases might be spoken in quite another rhythm, were they not associated with corresponding phrases that admit of no doubt. But in the whole combination, if one simply takes the youthful attitude towards the lines, pronouncing them with vivacity, so as to rouse the children's imagination and make them see the scene described, — that is, if one pronounces them with appropriate *πλάσμα* — then the rhythm is not doubtful at all. If one carries the vivacity a trifle farther, and gives to his utterance the musical quality of the singing voice, the rhythm becomes unequivocally that in which the lines are always sung.

Or in metrical symbols:



As the three parts are heard together, no confusion as to the relative lengths of syllables is possible. The movement is trochaic. The first *περίοδος* consists of three trisemes, making an incomplete dimeter, thrice repeated; the second is similar, but the second foot is now a plain trochee; the third consists of three dimeters, with one trochee resolved into a tribrach in the first *κῶλον*, two in the second, three in the third. No one will doubt that this correctly represents the time intervals of the music; any one who duly considers the terms in which I have stated the relation between the spoken rhythm and that of the music, and the true character and function of what the ancients called *πλάσμα*, must allow that the words carry the same rhythm independently.

As was remarked in the preceding chapter, a great number of lyric poems have been set to music on the same principle. The composer is absolutely free to substitute his own for the poet's rhythm, and commonly does so; but the older relation is so natural that it is even now often preferred throughout a song, and still oftener with only a few slight deviations. I will cite two examples to put beside the Heidenröslein, for still fuller illustration of what seems to me an important side of our subject.

The first is an old setting of Ben Jonson's To Celia; the metrical symbols alone will suffice, conforming strictly to the music, which may be found in the

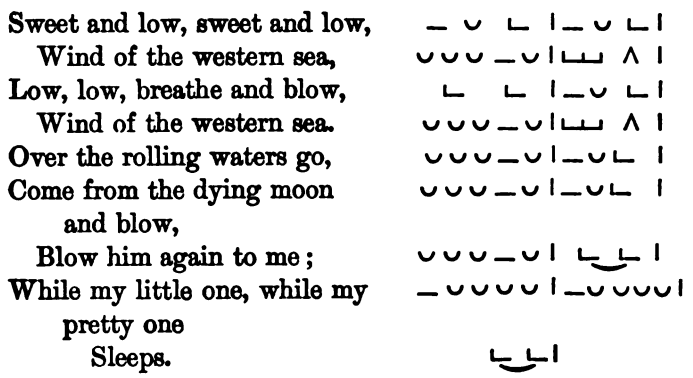
Collection Litolff, No. 839, English National Album, p. 16. Where the tune, however, passes from one pitch to another on the same syllable, my scheme unites the two eighth notes into one; the relation is exactly the same as in Greek music.

Drink to me only with thine eyes,
∪ ∪ ∪ – ∪ | – ∪ –
And I will pledge with mine;
∪ |– ∪ – ∪ | ⌣⌣ ∧|
Or leave a kiss but in the cup,
∪ ∪ ∪ – ∪|– ∪ –
And I'll not look for wine.
∪| – ∪ – ∪ | ⌣⌣ ∧
The thirst that from the soul doth rise
∪ | – ∪ – ∪ | – ∪ –
Doth ask a drink divine;
∪ | – ∪ – ∪|⌣⌣ ∧|
But might I of Jove's nectar sup,
∪ ∪ ∪ – ∪ | –∪ –
I would not change for thine.
∪| – ∪ – ∪ |⌣⌣

The musical time is $\frac{6}{8}$. Two things are noticeable. First, the syllables "Or leave a" and "But might I" would be read more naturally as ∪ | – ∪; but since the corresponding syllables of the opening line naturally take the musical form ∪ ∪ ∪, the composer has chosen to treat that as the model, and has followed it at the beginning of each couplet, except on the words "The thirst that." Secondly, it is a part of the *πλάσμα*, here carried a step farther than it was by the ancient musician, that all irrational syllables are in music made unequivocally short in the writing. On the other hand a solo singer rendering these lines with expression, giving the words

their due weight, would certainly depart from the exact ratios of the written notes, and would restore the irrationality. When irrational syllables are rather numerous in the verse, a composer who otherwise follows exactly the verse-rhythm is likely to shift the whole from an iambic or $\frac{3}{8}$ time to $\frac{2}{4}$ or $\frac{4}{4}$ time.

A modern song treated in like manner by the composer is Tennyson's Sweet and Low, set to music by J. Barnby. As before, I give of the music the rhythm only, since that alone concerns us; both words and music are well known wherever English is spoken. The time is again $\frac{6}{8}$.


Sweet and low, sweet and low,
Wind of the western sea,
Low, low, breathe and blow,
Wind of the western sea.
Over the rolling waters go,
Come from the dying moon
and blow,
Blow him again to me;
While my little one, while my
pretty one
Sleeps.

Two details call for farther notice. The last word, standing as it does for a whole line, is by the musician made equal to a line by prolongation through two measures: in the air and bass the whole is on one pitch, while the harmony is varied by simple changes in alto and tenor. This is an extreme instance of τονή to fill the time which a reader would simply leave vacant, waiting silently for the proper interval to elapse before beginning the next stanza. Also to the words

"little" and "pretty," the composer gave a dotted eighth and a sixteenth note instead of two eighths. These are the only departures from the rhythm given in my scheme.

The significance of these and like songs for our purpose lies in this. The musician felt and expressed the same rhythm as the poet. But the only notation of the poet was the words. They suffice in practice for one who knows the language, and they were enough to give the rhythm to the musician. But they do not require either poet or reader to analyze and state, even to himself, precisely what the rhythm is. But modern musical notation, vastly superior in this to the ancient, not merely permits but requires the relative length as well as pitch of every note to be written, and that too with a precision which often goes beyond that of the actual rendering, so that various signs, as a hold or *accelerando* or *tempo rubato*, are required to give warning that the rigid ratios of the notes are to be varied somehow. Owing therefore to this characteristic of his notation, the composer of necessity and habitually analyzes the rhythm and gives a full and exact account of it to himself and to his reader. Hence in such songs as these we have our commonest poetic rhythms described for us by men of special training in just that direction.

Nursery rimes that are not sung, nor accompanied by a rhythmical play, but are recited with delight by children, are another class of verbal combinations in which the rhythm is both independent and unmistakable. Children like to repeat them with complete *πλάσμα*, which in this case we call sing-song, of a kind that in them is often charming. It is chiefly the rhythm that makes the jingle pleasing; they therefore like to make the rhythm perfect with little reference to sense. When

real poetry is taken in hand, the childish tendency to recite it in a similar way has to be corrected, until what adults consider the proper balance between rhythm and sense is attained. But in the latter case also the essential character of the rhythm is the same. Without πλάσμα the rhythm is not mathematically exact; an educated adult does not wish it too exact. To recur to our old comparison, in a fine oriental rug the hand-made, slightly irregular ornament and intentionally varied symmetry are more interesting and more beautiful than the dead mechanical precision of a machine-woven pattern; but a geometrically perfect pattern may be said to lie at the basis of the Persian weaver's design. So in verse there is an exact pattern underneath, to which the reader approximates, now more closely, now less, as the phonetic character of the words or the requirements of sense and expression permit or demand. The great mass of English poetry moves in one or another variety of triple rhythm; but many examples, more especially but not exclusively comic, are in double or quadruple time.

Some have denied this and maintained the impossibility of it. One may even discern in some quarters the notion that a Hellenist, by reason of his acquaintance with ancient metric, is somehow disqualified for giving an opinion on the metric of modern languages. There is a historical reason for such prejudice, in that attempts have occasionally been made to apply rules of classical prosody to English, and men imperfectly acquainted with both Greek and English meters have transferred to the latter crude ideas of the former, with unedifying results. Hence an attempt to state in terms of time-ratios the rhythms of English verse rouses in some people a feeling of suspicion that sadly disturbs the judicial balance. In fact there is in the study of these rhythms

an almost unworked field for one who has the requisite preliminary training and is able to devote his attention without prejudice to the actual living facts of speech. What is needful is that one should calmly ask and consistently apply the answers to two questions — the same which Aristoxenos asked and answered in regard to Greek — namely: What is rhythm? and What rhythms are produced when young children who have no theory, or adults possessed of a cultivated taste, speak or read English naturally?[1]

Presupposing that mental attitude, — without which farther agreement in this direction is hopeless, — if any reader is inclined to distrust my determinations of rhythm in specific cases, I can only urge upon him two things. First, let him carefully observe the working of the tendency toward *πλάσμα*, not merely in himself and not merely in my examples, but in every-

[1] The late Sidney Lanier, in The Science of English Verse (N. Y., Scribners, 1880), brought to this subject the endowment of a genuine poet and of a competent musician — a rare combination. The essential truth of the matter he discerned and stated clearly. But he lacked the conventional philological and scientific training, and was both poet and musician; hence his presentation of the subject was not in the conventional manner of philologians, and repelled them, — especially those who were not musical and therefore could not understand him. Some important details also Lanier did not see quite correctly. Therefore the beginning made by him has not been followed up as it deserved. My paper, Quantity in English Verse (Trans. Am. Phil. Assoc., 1885, Vol. XVI, pp. 78–103), aimed to define more precisely and to extend Lanier's principles; it might be now much improved. Some scholars of repute, and even of well-deserved fame, were unable, in criticising us, to free their minds from a tangle of confused notions about word-accent and "quantity," and ask themselves the two fundamental questions above mentioned. But a younger generation is now approaching the subject; the growing appreciation of Lanier's poetry and the publication of his letters have led to better recognition of his critical insight, — of his power to draw

"From Art's unconscious act Art's conscious laws."

day life about him, whenever one makes an effort to convey the emotion or the full meaning of any form of words. Secondly, let the objector ask himself without prepossession whether his capacity for detecting and analyzing rhythm, in distinction from the power of originating or imitating it, has been in any way systematically developed. For example, has he learned to read music readily, or has he been trained or trained himself in genuinely quantitative reading of ancient verse, dactyls and anapæsts in quadruple time? If not, and if he has not also practised a good deal the analysis of rhythm in language, then he will do well to admit that his first impression on such questions may not be trustworthy. In regard to tune, a particular succession of pitch-intervals in the musical scale, we put little confidence in the judgment of one whose ear for pitch has not been well disciplined. If one cannot sing the scales correctly, or cannot tune a violin or tell with certainty whether a piano is in tune or not, — and some very good people and admirable scholars cannot, — then he rightly distrusts his opinion on such matters. The problem is at bottom the same in the two cases; in both it is a question of discriminating fairly simple ratios. In both cases the thing can be done by mechanical means, so that a person without ear, that is a person who has no native or acquired faculty in that line, must be convinced. But such mechanical determination of previously unknown pitch-ratios in music or time-ratios in language is difficult, requiring complicated and sensitive apparatus. In the case of rhythm the attempts hitherto made, so far as they are known to me, have produced no fully trustworthy results, owing to the imperfection of instruments or methods. More experimenters are now attacking the problem; better success will certainly

follow and is much to be desired.[1] But meantime, for the trained ear to determine the ratios between successive time-intervals in a rhythmical series is a task of the same kind as for the trained ear to determine the relative place, with reference to the musical scale, of successive tones in a melody. Instruments of precision are as necessary in the one case as in the other, and no more necessary. But the ear, in both cases alike, must have been adequately trained; else its judgment is without value. As regards music there are many in the community who have had the requisite training and practice, both for the pitch of the notes and for their rhythm; an orchestra plays together, musicians agree in their statements on such points, and we believe them. But language rhythms have received comparatively little attention from this point of view; that sufficiently accounts for the lack of agreement and the sense of help-

[1] My colleague, Professor Scripture, has for several years been conducting in the Yale Psychological Laboratory a series of experiments in this direction; the first instalment of his results appeared in the Studies from the Yale Psych. Lab. VII (1899). With his high sense of the delicacy and accuracy required in the apparatus, and his unusual skill in devising means of meeting those requirements, the mechanical problems have demanded much time for their solution. It quickly became apparent also that much preliminary work on the elementary sounds of language was necessary. Hence on the rhythmical problem hardly more than a beginning has been made. This beginning, however, has brought out some important facts, which will be cited later; and his researches promise to be of great value.

Not as a criticism of Professor Scripture, but for its general bearing, the following should be added. It sometimes detracts from the utility of such experiments that those who conduct them are apt to cherish too great confidence in the exclusive sufficiency of mechanical analysis, and cannot easily admit the inaccuracy of their own machines. That is a fault, when it exists, no less serious than the converse, undervaluation of such methods of study. The latter was once unduly prevalent and strong; the tendency now is to trust too exclusively to mechanism.

lessness before them that are so common. Even a musician whose rhythmic sense is unhesitatingly accurate in music may be obliged to accustom himself to the different character of the ῥυθμιζόμενον in speech before his ear becomes equally sure on rhythms that are really simpler. And then in rhythm, as in tone or harmony, it is one thing to reproduce a combination already noted down, or to make a new combination of your own, and another and a far less easy thing to distinguish accurately a combination that is merely heard. But a musician who is interested in the subject can with practice acquire a high degree of accuracy in analyzing rhythms of language. It is no claim of special proficiency on my part to say that in renewing such attempts frequently during nearly twenty years a marked gain in facility has been perceptible, though there are plenty of constant combinations, unhesitatingly made in ordinary speech and often heard, that still elude analysis. My experience is cited solely to illustrate the utility and the necessity of practice.

It is not my intention to go farther into details on the subject of English verse. From this unavoidable digression I return to the question which the preceding pages of the chapter lead up to: How, in general terms, does the rhythmizing impulse deal with English speech? Spoken words in connected discourse are a series of bodily movements producing sounds. If there were not a strong unconscious tendency to rhythmize those movements and the corresponding sounds, then language would be the sole exception in the whole life of man to the otherwise universal rule; we should have in language many series of sounds indissolubly united with voluntary but almost automatic bodily movements, repeated many times daily, eminently rhythmizable, yet

not rhythmized. Of course the exception does not exist. The rhythms produced are of essentially the same character as those of labor, or of music. How are they produced in the medium of the English language?

On an earlier page emphasis was laid on the fact that certain limits, between which the duration of syllables may vary, are fixed. Here it must be emphasized that every syllable and every vowel and every consonant, within those limits, is more or less variable. The elasticity of English consonants was noticed at length by Sweet in his article On Danish Pronunciation (Trans. Phil. Soc., 1873–4, p. 110), and was dwelt on in my paper above referred to (p. 98f.); gramophone records prove it beyond all possibility of doubt, and for mutes no less than for fricatives and liquids. (See Scripture, op. cit., passim.) This furnishes for the free working of the rhythmizing impulse a range no less wide than is furnished in the laborer's task by the natural play of limb and muscle; which is also confined within strict limits, for the human leg can step and the human arm reach and the individual muscle contract only so far. In not a few syllables the elasticity resides far more in the consonantal part than in the vowel; and the ear is more offended by much prolongation of accented "short" vowels like those of *pin*, *sunny*, *many*, *valley*, than by the prolongation of adjacent consonants or unaccented vowels, or by the shortening of "long" vowels or diphthongs.

Another principle is of great importance. The smallest time-intervals recognized as constituents of rhythm are those marked by the syllables, not those of the separate vowels and consonants within the syllable. The times of the elements united into a syllable are not separately noted with reference to any ratios between them-

selves. The times of the syllables are so noted, with reference to ratios between them, and as forming little groups, feet, which form larger groups. The times of the successive sounds within a syllable flow on and run into each other without break; but something happens in passing from one syllable to the next that causes us to feel that there a break was made. That is what chiefly gives language its articulate or jointed character. Precisely where in the flow of sounds that articulating process, that audible break, occurs — if we come down to the minutest measurement — it is difficult to say; but it occurs somewhere; all recognize that speech is jointed and that syllables are real entities. It occurs somewhere between the vowels. Rhythmically, as it appears to me, it is the beginning of the vowel that begins the new rhythmic time. That is the place where the sound becomes louder again, where the stronger vibrations originating in the vocal chords reach the ear with less hindrance and with heavier impact. This would account for the fact that the consonants, however many, before the first vowel of a line or κῶλον have no rhythmical effect, in Greek, Latin, or English. Anyhow, the syllabic times are the smallest constituents of rhythm recognized as distinct by the rhythmic sense. If the curve of a transcribed gramophone record be so enlarged that three syllables making a dactyl ocupy 300 mm., it may not be possible to point out within a millimeter where the transition from one syllable to the next occurs; but it will be possible to locate it within perhaps 10 mm., and the transition is a real thing, the syllable a distinct rhythmic time.

Given, now, any series of words, selected wholly without reference to rhythm, simply to convey an idea in ordinary talk, any one who speaks naturally the entire

series yields unconsciously to an impulse to arrange the syllabic times in some regular or approximately regular way. To that end he deals pretty freely with the times of individual vowels and consonants, extending some, contracting others. Conspicuous points which he takes account of first of all, and is impelled to make most distinctly regular in their arrangement, are the more prominent among the accented vowels. But there is considerable freedom even here; some vowels that are certainly accented and felt as accented are yet made subordinate to others that occur in a more convenient location for the immediate purpose, and some vowels of slight prominence, or not accented at all in other combinations, if they chance to stand more conveniently, may be treated in the rhythm as the equals of strongly accented ones. Yet the sense of separate individuality in the syllables includes a recognition of limits to the freedom of treatment, to exceed which would be distortion. Therefore in ordinary conversation the rhythmizing impulse is only partially successful; it is held in check by the previously determined character of the *ῥυθμιζόμενον*, by the sense that if one prolongs or shortens syllables too much they will sound queer. That would offend more than the resulting rhythm would please. Hence there are frequent interruptions of the even flow. A few successive syllables take easily a distinct rhythm; then comes an obstruction, a little shift, then a few more syllables more easily arranged, and so on with infinite variety. The impulse is constant so long as the words come without hesitation; obstructions are frequent, changes in the character of the rhythm from one phrase to another are numerous, the result so complex that detailed analysis is impossible without instruments, and those more perfect than have yet been employed. Such

is the process in speech when the words are not originally selected or arranged at all with reference to rhythm.

But every one who speaks or writes carefully for the public, if while making his sentences he is conscious of their sound (some are not so conscious), does select words and arrange them more or less, to make them easier for the rhythmizing impulse to deal with to its satisfaction, so that they may more easily assume a somewhat closer approach to regularity. Somewhat closer, I say; for we do not like a too perfect rhythm in professed prose. Aristotle has put this as well as any one. *τὸ δὲ σχῆμα τῆς λέξεως δεῖ μήτε ἔμμετρον εἶναι μήτε ἄρρυθμον· τὸ μὲν γὰρ ἀπίθανον (πεπλάσθαι γὰρ δοκεῖ) καὶ ἅμα καὶ ἐξίστησιν· προσέχειν γὰρ ποιεῖ τῷ ὁμοίῳ, πότε πάλιν ἥξει. . . . διὸ ῥυθμὸν δεῖ ἔχειν τὸν λόγον, μέτρον δὲ μή· ποίημα γὰρ ἔσται. ῥυθμὸν δὲ μὴ ἀκριβῶς· τοῦτο δὲ ἔσται ἐὰν μέχρι του ᾖ.* (Rhet. III, 8, 1–3.) "The words should be neither metrical or unrhythmical. The former awakens mistrust, for it seems artificial; at the same time it puts one out, for it makes one look for the like and ask when it will recur. Hence prose should contain rhythm, but not meter, else it will be verse. And rhythm not too exactly; as when it is carried only to a certain extent." That is, no one pattern may be carried far or repeated in close proximity without drawing attention to itself away from what is more important, and that would not be agreeable. If the thought rises for a moment, becoming nobly emotional, elevated, what we call poetical, our sense of propriety admits a closer approach to perfect rhythm. But such closer approach when the thought is not distinctly above the ordinary prose level is felt to be affectation and pretence, form without the substance. But whether the composition be easy or not for the rhythmizing

impulse to deal with, and whether the resulting rhythm be appropriate and pleasing or not, the process in reading the composition aloud is the same as before, — an entirely unconscious one in most people, more or less consciously attended to by the actor or practised speaker.

In the expression of the best thought and the higher ranges of emotion, in the "most perfect speech of man," we think a more perfect rhythmical form appropriate. We expect the poet to wed his thought to melodious verse, — so to select and arrange words that the voice will easily effect a satisfying arrangement of the times. The process in speaking them is still the same; but the material supplied is more readily arranged, and the result is more regular, — is not only ῥυθμός, but μέτρον, in Aristotle's sense. And in verse itself there are all grades of success in rhythm; even in a single author like Robert Browning we find some poems or lines of exquisitely perfect form beside others in which the author's intention is not clear, to the vexation of the reader.

Thus three classes of cases may be distinguished, of three grades of adaptability to rhythmization in delivery. But the classes are evidently not separated by a sharp dividing line; such classification is nothing but a convenience in presentation. In reality there is no break in continuity in the series of cases, and no essential change in the mode of vocal action, in passing from the most unstudied or least rhythmical utterances of everyday life to the most perfect examples of poetic rhythm. To repeat once more the fundamental principle which we have reached, and from which this whole investigation sets out: All speech, like all other bodily activity in which similar movements are repeated at brief inter-

vals of time, tends towards rhythm, and approaches regularity of rhythm as closely as the phonetic and semantic character of the words, all things considered, permits. For simplicity our attention in this chapter has been confined to English; but the principle is probably universal. It certainly applies to the few languages which I know enough about to judge. In literature poetry is generally earlier than prose, in great part because verse as an artistic rhythmical form is simpler and more intelligible than prose. It therefore pleases earlier, — pleases composer and listener alike. Verse isolates a single pattern of rhythm from the tangle of rhythms made in ordinary speech. What is said in that more easily followed form — always provided a content of thought and feeling that seems worthy of it — pleases primitive man, as simple rhythms of all kinds please children. One needs considerable literary training to see an artistic form in prose, which is, as rhythm, so much more complex. This is like what has happened in music. Simple melody pleased first; perfect concords pleased earlier than the less perfect; discords are not received into music till quite late; numerous accidentals and free modulations, mingling different keys, require for their appreciation a high degree of culture of the musical sense, such as only a fraction of the people even in the most musical nations have attained. In the study of music, and likewise in the study of rhythm in language, one naturally begins with the simpler.

Another fundamental principle, implied in what precedes but requiring distinct statement, is this. In studying specific language rhythms — I do not say in teaching the beginner, but in trying to ascertain their real character — we must start from the larger group of words

rather than from the syllable or the foot. This is merely applying in metric the principle which has been reached by the student of phonetics generally and by students of syntax. In all alike the sentence, the *Satz*, the larger grouping, may be analyzed into smaller groups, — into words bearing certain syntactical relations to each other, or into feet, syllables, individual sounds, which last are also not simple. But alike in all three fields every smaller unit reached by analysis is much influenced by its surroundings; other surroundings may transform it; these must therefore in each instance be all duly taken into account. The moment you isolate the smaller unit and consider it without reference to collocation, you are treating a variable as a constant. That is a frequent source of error in a good many fields. A problem solved by the aid of that assumption is not solved, in metric any more than in mathematics. To understand the nature of the smaller metrical units we must watch them *im Werden*, observing first, as we have been doing, how the voice deals with the larger group of words, and secondly, what the composer does who combines words with the aim of producing a particular rhythmical pattern. Let us look at the matter a moment from the latter side.

Negatively, we must not conceive that process as one of addition, in which the lower units, whatever elements the larger group when analyzed is found to contain, are taken like so many bricks or stones already shaped, and built up into the larger structure. The process is rather to be compared — except in rapidity, where the difference is immense — to the growth of a plant, in which the vital force pervades every part, and all the parts, larger and smaller, adjust themselves to each other in a living and organic relation. This is true of music and the

dance no less than of poetry; but we will look only at the last. All poets who have given us any account of their experience in the act of poetic creation agree on this point. Not the single sound, nor the syllable, nor even the word is to their feeling the unit; but the phrase, the line, the whole poem. Illustrations might be multiplied; two will suffice. Lowell in his letters describes the writing of his masterpiece, the Commemoration Ode. "The ode itself," he wrote to Mr. Gilder, "was an improvisation. Two days before the Commemoration I had told my friend Child that it was impossible — that I was dull as a door-mat. But the next day something gave me a jog and the whole thing came out of me with a rush. I sat up all night writing it out clear, and I took it on the morning of the day to Child." Again to T. W. Higginson, "I was longer getting the new (eleventh) strophe to my mind than in writing the rest of the poem. In that I hardly changed a word, and it was so undeliberate that I did not find out till after it was printed that some of the verses lacked corresponding rhymes." The poem as delivered was over four hundred lines long, in complicated and changing meter. O. W. Holmes also in his Autocrat at the Breakfast Table compares the conceiving a lyric poem to being hit by a bullet in the forehead. Many people who lay no claim to genius have had experiences resembling these nearly enough to understand such accounts perfectly. Ribot in a recent article on The Nature of the Creative Imagination (International Monthly, July, 1900) devotes some pages to the psychology of such inspiration, emphasizing the suddenness and also the impersonal, unconscious, subterraneous aspect of it in its ordinary form. Isolation of the single syllable or word, and conscious calculation of its relative space in the pattern is wholly

absent. Single effects may indeed be altered by calculated substitution of word or phrase; but even here what we have is still primarily and distinctly a reshaping of the larger unit — not a mechanical building up of syllable on syllable already shaped beyond the poet's control before he picks them out. Within certain limits they are unformed and plastic until fixed in a specific collocation, which then — speaking generally — admits without distortion only one rhythm, that which the poet had in mind.

Now holding fast this recognition of the fact that the poet's mental action is so rapid and is largely below the level of consciousness, and that, dealing primarily with the larger group, he considers the single syllables only in their relation to that, we may describe in the following way the purely metrical side of what he does in composing English verse. He so selects and arranges words that the reader will find strongly stressed syllables coming naturally into the majority of the more prominent times of the desired rhythm, — or into enough of these to determine clearly how the other syllables are to make the rest of the pattern. The only essential feature of our word-accent is stress; other elements, like change of speech-tune, may be present or absent, and are variable; but removal of stress to another syllable is a change in accentuation. The stress accent in our words being very little under the arbitrary control of the poet or of any individual, we say it is fixed. It could easily be proved by scores of examples that, as was said above, a degree of freedom is permitted even here that would surprise one who has not given attention to the question; but it is still true that the principal word-accents determine the majority of the more prominent time-intervals. That is a fuller and more detailed

statement of what we mean, and of all that we ought to mean, in saying, as we do with truth, that English verse is based on word-accent. But in all this there is no place for the pernicious assumption that in English an accented syllable is long, the unaccented short. Only in a sense that is misleading, and has misled most writers on English metric, can those terms be treated as generally convertible or equivalent. Until that equation is definitely discarded, clear notions of rhythm in English are practically impossible. At least one modern poet besides Lanier, namely Tennyson, recognized this distinctly; and it would be difficult to find a poet possessing a keener insight into the principles of his own art.

To indicate precisely what is properly meant by saying that Greek versification, in contrast with English, is based on quantity, the matter may be put thus. In English and German speech much is made of differences in stress, quite apart from versification. Some syllables are passed over so lightly that one may even doubt whether a separate syllable is formed or not, and usage may vary on the same syllable. Others are spoken always distinctly and forcibly; these by contrast appear very heavily stressed; in most words of more than one syllable usage has settled which one shall receive the heaviest stress. Monosyllables pronounced alone all seem accented; in continuous discourse some are felt to be more significant and are more likely to receive a stress, others less important are likely to be passed over lightly. For rhetorical purposes also much use is made of stress, which is heavier on the more emphasized word, lighter on the less important; thus stress is made to render part of the service in conveying meaning that in Greek or Latin was rendered by word-order. In these several ways all grades of variation in stress between the

two extremes are in constant use. To my ear modern Greek and Italian seem to make distinctly less use of it; apparently different dialects vary a good deal in this regard, and of course no one doubts that those languages also employ it enough to be properly called accentual. In ancient Greek on the other hand stress had but a narrow field; it was at least as nearly level as in modern French, probably more so. Between word-order, particles, and the pitch-accent, about all the functions of stress in English, leaving rhythm out of view, appear to have been fully supplied without stress. A stress so nearly level that speaker and listener were hardly conscious of any variation could not play a leading part in determining rhythm. Shifting of the points of slightly heavier stress from one syllable to another, for any reason, could not cause any confusion or seem strange, — as with us variation of the speech-tune on the same word in different collocations does not seem to affect in the least the identity of the words, although in Greek it did, except in singing. Even in modern French a good deal of such shifting of stress, of which the Frenchman is perhaps not conscious, is noticed by the foreigner. When a Frenchman with a good command of English speaks it in some excitement, he is apt to treat our accents with the freedom of his own language, as rather variable, unless he has acquired with remarkable thoroughness our peculiar intonations. On the other hand, as every Greek syllable (elision and the like apart) was pronounced with fairly equal precision, variations in quantity or quality of vowel or consonant, such as we admit freely in unstressed syllables, were of necessity less free. Without at least some variation in time of pronunciation of the separate elements rhythm was impossible; but the limits were narrower; in compari-

CENTRAL COLLECTION

son with English, quantity may be said to have been fixed. The difference between "long" and "short" syllables was just about as distinct as in English between accented and unaccented, and could no more be overlooked by the ordinary speaker.

A Greek, therefore, desiring to produce a particular χρόνων τάξις, so selected and arranged words that the reader would find long syllables coming naturally into the majority of the more prominent times, — or into enough of these to determine clearly the place of the other syllables in the arrangement, *i. e.*, how the other syllables should constitute the other times. The question whether any stress at all accompanied the more prominent times, which were marked by the down beat when one kept time by beating, I still postpone a little. Finally it should be noted that a very slight change in the relative prominence of stress in comparison with qualitative precision, in the utterance of groups of syllables, is enough to cause a language to shift from the accentual to the quantitative basis in rhythmization. It is therefore nothing surprising that the two systems existed for generations side by side in late Latin and Greek.

IV

RHYTHM IN GREEK

By this gradual approach, from the side of rhythm in nature and in other activities of man, through rhythm in a typical living language, we have finally reached the central problem of Greek rhythm. The reader cannot but inquire whether this conception of rhythm is not inapplicable to Greek, because based too much on habits of speech purely modern, or at least not Greek. Was there any recognition of such ideas by the ancients themselves? To answer this requires examination of several passages from Aristoxenos and others; and a careful examination, because previous discussion of the same passages by the most competent scholars has in part issued in very diverse interpretation. Only some method of approach at least partially new, and implying wider comparison and induction, combined with more careful scrutiny, affords any hope of advance.

We have seen that Plato, Aristotle, and their successors were aware that rhythm has a large place in nature, though they could not realize so fully as we how large; also that they did not overlook the natural bond of kinship uniting the various forms of rhythm in many human activities, whereof speech is one. But this is not enough. Have we evidence that competent ancient observers recognized in syllabic quantities the degree of elasticity assumed? And did their conception of rhythm in language admit such unbroken gradation from simple speech through artistic prose and spoken verse

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to song? At least the former of these two questions, the fundamental one, has been generally answered in the negative. The reason for that appears to be that statements of the metrici, interpreted with a little twist because not taken in their true relation to other evidence, created a strong prepossession in favor of the hard and fast rule, long is to short as two to one. The other evidence was approached with that prepossession well settled; consequently statements of Aristoxenos that would otherwise have seemed sufficiently clear were explained away, or were taken with such restrictions that the real force was obscured. It is necessary to put aside that prepossession; to aid in clearing it away was part of the object of Chapter II, "Rhythmicus or Metricus?"

In that chapter (pp. 42–52) were quoted a series of passages differentiating 'rhythmi' from 'metra,' and declaring that in 'rhythmi' — that is, as we found, in more elaborate melic verse — the times of syllables were shortened and prolonged with great freedom, in disregard of the "metrical" rule of two to one; that rule prevailed only in the 'metra' or verses of the simpler type, which were destined for reading only, — or which at any rate preserved their proper rhythm in plain reading unadorned by *πλάσμα*. I see no admissible understanding of those paragraphs that does not include the conception of considerable elasticity of syllabic quantity, at least in lyric verse. Those texts, however, do not stand alone, but are supplemented by others that accord with them and state the matter more plainly.

The very term *ῥυθμιζόμενον*, applied to the material or medium which embodies a *χρόνων τάξις* and makes it perceptible to one or more of our senses, of itself naturally suggests the same conception. Unless there is positive evidence to the contrary, he who employs

that present passive participle to denote λέξις, *κίνησις σωματική*, μέλος, and any other medium of rhythm, must be understood to mean that all alike are rhythmized, or submitted to a shaping force from without; that the ῥυθμοποιός shapes and puts into rhythm a material more or less plastic, or capable of being moulded. And Aristoxenos explicitly says this in the following words:

Νοητέον δὲ δύο τινὰς φύσεις ταύτας, τήν τε τοῦ ῥυθμοῦ καὶ τὴν τοῦ ῥυθμιζομένου, παραπλησίως ἐχούσας πρὸς ἀλλήλας ὥσπερ ἔχει τὸ σχῆμα καὶ τὸ σχηματιζόμενον πρὸς αὐτά. ὥσπερ γὰρ τὸ σῶμα πλείους ἰδέας λαμβάνει σχημάτων, ἐὰν αὐτοῦ τὰ μέρη τεθῇ διαφερόντως, ἤτοι πάντα ἤ τινα αὐτῶν, οὕτω καὶ τῶν ῥυθμιζομένων ἕκαστον πλείους λαμβάνει μορφάς, οὐ κατὰ τὴν αὐτοῦ φύσιν, ἀλλὰ κατὰ τὴν τοῦ ῥυθμοῦ. ἡ γὰρ αὐτὴ λέξις εἰς χρόνους τεθεῖσα διαφέροντας ἀλλήλων λαμβάνει τινὰς διαφοράς, τοιαύτας αἵ εἰσιν ἴσαι αὐταῖς τῆς τοῦ ῥυθμοῦ φύσεως διαφοραῖς. ὁ αὐτὸς δὲ λόγος καὶ ἐπὶ τοῦ μέλους καὶ εἴ τι ἄλλο πέφυκε ῥυθμίζεσθαι τῷ τοιούτῳ ῥυθμῷ ὅς ἐστιν ἐκ χρόνων συνεστηκώς. (P. 268, 270 Mor.)

That is: "We are to regard these as two natures, as it were, that of the rhythm and that of the rhythmized material, so related to each other as are the form and the material formed. Just as the body, for example, takes various shapes, if its parts are differently placed, either all or some of them, so too each of the *ῥυθμιζόμενα* takes various forms, not by virtue of its own nature but by virtue of that of rhythm. For example, the same group of syllables, when put into different time-intervals, takes on certain differences, such as are equal to differences which in themselves belong to the nature of the rhythm. The same statement holds also in the case of a melody, and of anything else that is capable of rhythmization by such a rhythm as consists of times."

The last phrase is added to exclude other senses of ῥυθμός discussed in the previous book, particularly the application to objects without motion. I do not see how the doctrine in question could be stated more clearly. Observe first the nature of his illustration. There is no hint that σῶμα is to be taken in any other than its ordinary sense. The human body takes an infinite variety of shapes or postures, as the limbs, neck, shoulders, trunk, are differently bent, extended, contracted. There are strict limits of height, breadth, and so on; the weight remains the same; but within those limits the dimensions are varied at will. This is in the realm of space. So of each ῥυθμιζόμενον in the realm of time. And luckily the ῥυθμιζόμενον to which he now specifically applies the doctrine is language. The same word or group of words may be put by the ῥυθμοποιός into different time-intervals, whose differences are inherent in the different rhythms, not in the words. The particular rhythm is conceived as a mould or pattern to which a pliable material is made to conform; the pattern exists in the mind of the ῥυθμοποιός, and receives objective audible existence only by embodiment in a ῥυθμιζόμενον. Examples of syllabic groups variously rhythmized are easily found. The phrase Ἀχιλλέως παῖ begins an iambic trimeter in Soph., Phil. 50; in 57 the same words are embedded in the line, thus:

λέγειν, Ἀχιλλέως παῖς· τοδ' οὐχὶ κλεπτέον.

The two rhythmical values of the phrase are (using > to indicate an irrational syllable) ∪ – ∪ – > and ∪ – > –. Again, Theognis begins a dactylic hexameter with the words εὐχομένῳ μοι κλῦθι; he has also the elegiac pentameter

ἀείσω· σὺ δέ μοι κλῦθι καὶ ἐσθλὰ δίδου.

The words *μοι κλῦθι* have the two values — — ∪ and ⏑ — ∪. Again, the word *αὐτῷ* would ordinarily have in the hexameter the value — —, or before a vowel — ∪; in iambic trimeter the value might be >— or —>; in Aisch., Ag. 170 f.

Ζεὺς ὅστις ποτ' ἐστίν, εἰ τόδ' αὐτῷ φίλον κεκλημένῳ

the value is ⏑ —. Such examples are plenty enough. In each case it is the neighboring syllables that show which of the possible values was intended by the poet. It is strange that the plain meaning of *εἰς χρόνους τεθεῖσα διαφέροντας* is not accepted in full by Westphal (Gr. Rhythmik, p. 70). He translates *τεθεῖσα zerlegt*, and selects for an example the phrase *ἔθανες ἀπελύθης*, which can be differently *divided* as trochaic, iambic, anapæstic, dochmiac, with no alteration of relative times for the syllables, except that the final syllable in the iambic form is irrational. Yet as parallel examples of *μέλος* he cites musical phrases in which the same pitch intervals are employed, but with differences between the time-ratios. These musical examples conform exactly to the meaning of Aristoxenos; only in the case of *λέξις* does Westphal refuse to admit that meaning, because on other (and mistaken) grounds he had decided that syllables were not thus elastic. This is not the only instance where Westphal, carrying through with strict logic a preconceived belief, has misinterpreted the author to whom he devoted his life, and for our understanding of whom he has done more than any other man. The paragraphs that follow the above in the *ῥυθμικὰ στοιχεῖα* enlarge upon and carry out into some details the same conception of syllabic quantities. Thus it is affirmed that the rhythm is *οὐδενὶ τῶν ῥυθμιζομένων τὸ αὐτό, ἀλλὰ τῶν διατιθέντων πως τὸ ῥυθμιζόμενον καὶ ποιούντων κατὰ τοὺς*

χρόνους τοιόνδε ἢ τοιόνδε. (II § 5 W.) In διατιθέντων πως alone there might be ambiguity; but none is left when it is added that the rhythm "makes the rhythmized material of this or that character as regards its time-intervals." Farther at the end of § 8: τοιοῦτον νοητέον τὸ ῥυθμιζόμενον οἷον δύνασθαι μετατίθεσθαι εἰς χρόνων μεγέθη παντοδαπὰ καὶ εἰς ξυνθέσεις παντοδαπάς. Capability of very various rhythmization is affirmed of all ῥυθμιζόμενα.

The distinction between ῥυθμός and ῥυθμοποιία points the same way; it is set forth in the following paragraphs of the ῥυθμικὰ στοιχεῖα.

(1) Ὅτι δ' ἐστὶν οὐ τὸ αὐτὸ ῥυθμοποιία τε καὶ ῥυθμός, σαφὲς μὲν οὔπω ῥᾴδιον ἐστι ποιῆσαι, πιστευέσθω δὲ διὰ τῆς ῥηθησομένης ὁμοιότητος. ὥσπερ γὰρ ἐν τῇ τοῦ μέλους φύσει τεθεωρήκαμεν, ὅτι οὐ τὸ αὐτὸ σύστημά τε καὶ μελοποιία, οὐδὲ τόνος, οὐδὲ γένος, οὐδὲ μεταβολή, οὕτως ὑπολεπτέον ἔχειν καὶ περὶ τοὺς ῥυθμούς τε καὶ ῥυθμοποιίας, ἐπειδήπερ τοῦ μέλους χρῆσίν τινα τὴν μελοποιίαν εὕρομεν οὖσαν, ἐπί τε τῆς ῥυθμικῆς πραγματείας τὴν ῥυθμοποιίαν ὡσαύτως χρῆσίν τινά φαμεν εἶναι. σαφέστερον δὲ τοῦτο εἰσόμεθα προελθούσης τῆς πραγματείας. (P. 282 f. Mor.; II § 13 W.)

(2) Δεῖ δὲ μὴ διαμαρτεῖν ἐν τοῖς νῦν εἰρημένοις, ὑπολαμβάνοντας μὴ μερίζεσθαι πόδα εἰς πλείω τῶν τεττάρων ἀριθμόν μερίζονται γὰρ ἔνιοι τῶν ποδῶν εἰς διπλάσιον τοῦ εἰρημένου πλήθους ἀριθμὸν καὶ εἰς πολλαπλάσιον. ἀλλ' οὐ καθ' αὑτὸν ὁ ποὺς εἰς τὸ πλέον τοῦ εἰρημένου πλήθους μερίζεται, ἀλλ' ὑπὸ τῆς ῥυθμοποιίας διαιρεῖται τὰς τοιαύτας διαιρέσεις. νοητέον δὲ χωρὶς τά τε τὴν τοῦ ποδὸς δύναμιν φυλάσσοντα σημεῖα καὶ τὰς ὑπὸ τῆς ῥυθμοποιίας γινομένας διαιρέσεις· καὶ προσθετέον δὲ τοῖς εἰρημένοις, ὅτι τὰ μὲν ἑκάστου ποδὸς σημεῖα διαμένει ἴσα ὄντα καὶ τῷ ἀριθμῷ καὶ τῷ μεγέθει, αἱ δ' ὑπὸ τῆς ῥυθμο-

ποιίας γινόμεναι διαιρέσεις πολλὴν λαμβάνουσι ποικιλίαν. ἔσται δὲ τοῦτο καὶ ἐν τοῖς ἔπειτα φανερόν. (P. 290 f. Mor.; II § 19 W.)

(3) *Τῶν δὲ χρόνων οἱ μέν εἰσι ποδικοί, οἱ δὲ τῆς ῥυθμοποιίας ἴδιοι. ποδικὸς μὲν οὖν ἐστι χρόνος ὁ κατέχων σημείου ποδικοῦ μέγεθος, οἷον ἄρσεως ἢ βάσεως, ἢ ὅλου ποδός. ἴδιος δὲ ῥυθμοποιίας ὁ παραλλάσσων ταῦτα τὰ μεγέθη εἴτ' ἐπὶ τὸ μικρὸν εἴτ' ἐπὶ τὸ μέγα. καὶ ἔστι ῥυθμὸς μὲν ὥσπερ εἴρηται σύστημά τι συγκείμενον ἐκ τῶν ποδικῶν χρόνων ὧν ὁ μὲν ἄρσεως, ὁ δὲ βάσεως, ὁ δὲ ὅλου ποδός· ῥυθμοποιία δ' ἂν εἴη τὸ συγκείμενον ἔκ τε τῶν ποδικῶν χρόνων καὶ ἐκ τῶν αὐτῆς τῆς ῥυθμοποιίας ἰδίων.* (Frag. Psell. 8.)

The above may be translated thus. "That *ῥυθμοποιία* is not the same thing as rhythm it is not easy to make clear as yet, but let the following comparison induce belief. As in the nature of music we have observed that *σύστημα* is not the same as *μελοποιία*, nor yet *τόνος* nor *γένος* nor *μεταβολή*, so also you are to understand in regard to rhythm and *ῥυθμοποιία*; since we found that *μελοποιία* is a particular treatment or concrete example of tune, and in the discussion of rhythmic we say in like manner that *ῥυθμοποιία* is a particular treatment or concrete example of rhythm."

"But you must avoid going astray in the statements just made, by supposing that a foot is not divided into a greater number of parts than four. For some of the feet are in fact divided into twice that number of parts and into several times as many. Not in itself, however, is the foot divided into more than the aforesaid number of parts, but such divisions are produced by the *ῥυθμοποιία*. We must consider as distinct the *σημεῖα* that preserve the character and significance of the foot and those divisions that are produced by the *ῥυθμοποιία*.

And it must be added to the foregoing that the *σημεῖα* of each foot continue the same, equal in number and magnitude, while the divisions produced by the *ῥυθμοποιία* admit great diversity. This will be plain as we go on."

"Of the time-intervals some are characteristic of the foot, others peculiar to the *ῥυθμοποιία*. A foot-time is one that retains the magnitude of a *σημεῖον* of the foot, as of arsis or thesis or a whole foot; a time peculiar to the *ῥυθμοποιία* is one that changes these magnitudes, whether in the way of diminution or of increase (or, that varies from those magnitudes more or less). And rhythm, as has been said, is a system made up of foot-times, one of which is that of the arsis, another that of the thesis, another that of the whole foot; while a *ῥυθμοποιία* (*i. e.*, a concrete specimen) would be that which is made up of both the foot-times and those peculiar to the *ῥυθμοποιία* itself."

With these may be put a passage from the Harmonica. Aristoxenos has been explaining that one must in the study of music accustom oneself to judge accurately by hearing, and the more so because the study has to do in part with magnitudes, that is pitch-intervals, that are not constant. Emphasizing and illustrating the changeable character of some of those magnitudes, he says (p. 34 Mb.):

Πάλιν ἐν τοῖς περὶ τοὺς ῥυθμοὺς πολλὰ τοιαῦθ' ὁρῶμεν γιγνόμενα· καὶ γὰρ μένοντος τοῦ λόγου καθ' ὃν διώρισται τὰ γένη τὰ μεγέθη κινεῖται τῶν ποδῶν διὰ τὴν τῆς ἀγωγῆς δύναμιν, καὶ τῶν μεγεθῶν μενόντων ἀνόμοιοι γίγνονται οἱ πόδες· καὶ αὐτὸ τὸ μέγεθος πόδα τε δύναται καὶ συζυγίαν· δῆλον δ' ὅτι καὶ αἱ τῶν διαιρέσεων τε καὶ σχημάτων διαφοραὶ περὶ μένον τι μέγεθος γίγνονται. καθόλου δ' εἰπεῖν ἡ μὲν ῥυθμοποιία πολλὰς καὶ παντοδαπὰς κινεῖται, οἱ δὲ

πόδες οἷς σημαινόμεθα τοὺς ῥυθμοὺς ἁπλᾶς τε καὶ τὰς αὐτὰς ἀεί.

In English: "Again in dealing with rhythms we see many such phenomena. While for instance the ratio remains the same, by which the classes of rhythm are determined, the magnitudes of the feet are changed by the effect of the tempo; and again the feet are rendered unlike while magnitudes remain the same, so that the same magnitude equals now a foot now a dipody; evidently in that case the differences in the divisions and the forms are made in connection with a magnitude that is constant. And in general *ῥυθμοποιία* undergoes many changes of various kinds, while the feet by which we mark for ourselves the character of the rhythms admit only changes that are simple and always the same."

These sentences need little farther elucidation.[1] Aristoxenos conceived of each particular sort of rhythm as consisting of feet of the appropriate kinds, admitting, as distinct feet, only a limited number of changes. For example, dactylic rhythm in the abstract contains only dactyls varied to spondees, which introduce no new *χρόνοι ποδικοί*; and in the hexameter no other times, peculiar to the *ῥυθμοποιία*, are admitted. Iambic rhythm in the abstract contains only iambi, varied to tribrachs, of which the *χρόνοι ποδικοί* are those of arsis, thesis and whole foot, in the ratio of 1, 2, 3; the iambus contains the times 1+2=3, the tribrachs the times 1+1+1=3. But in actual *ῥυθμοποιία* in the iambic class the lyric poets introduced many variations, producing a rather large set of times peculiar to the *ῥυθμοποιία*. Thus in place of ∪ – might appear ∪ ⌙, in which a thesis and

[1] Cf. Westphal, Gr. Rhythmik, pp. 119–130.

following arsis unite into one χρόνος that oversteps the boundary of the foot as they conceived it; in place of ∪ – ∪ – ∪ might appear ∪ ⌊– ⌊–. These and many other variations from the theoretical forms (by which nevertheless the fundamental character of the movement is determined) are part of a rhythmizing process that moulds a plastic material; the simple adding together of long and short syllables, in the ratio of two to one, cannot produce such combinations. The result is that in ῥυθμοποιία the divisions are in truth often manifold, and the πόδες σύνθετοι of Aristoxenos might be divided into several times four parts, while the simple feet in their theoretical form, which the conductor followed in his beating (as the modern conductor does), and which ran along in the mind of the musician as the skeleton pattern underlying the complicated ῥυθμοποιία, contained but two, three, or four χρόνοι ποδικοί. The whole ῥυθμοποιία as a concrete thing would thus in fact be a compound made up of the χρόνοι ποδικοί and those peculiar to the ῥυθμοποιία. Those verses which the metricians called 'rhythmi' in the passages quoted above (p. 42–52) were examples of this, in contrast with the 'metra,' which contained little, many of them nothing, outside of the χρόνοι ποδικοί. To us this separate treatment of the two systems of times, those of the ῥυθμός and those of the ῥυθμοποιία,[1] seems at first rather strange, perhaps more obfuscating than clarifying; Aristoxenos found, as we have seen, that it struck his listeners and readers in the same way. In reality the χρόνοι τῆς ῥυθμοποιίας ἴδιοι are as normal as the χρόνοι ποδικοί,

[1] The new fragments published by Grenfell and Hunt (Oxyrhynchus Papyri, Pt. I, pp. 14–21) appear to be from a section on ῥυθμοποιία, and from the second chapter of it, that on χρῆσις. Compare Aristid. Q., p. 42 Mb.

and stand on the same level with them. Both alike arise naturally in the rhythmizing process, and the still more intricate time-intervals of prose are no less legitimate and natural. But there can be no doubt what the idea of Aristoxenos was. And as a solid basis for the distinction remains the fact that in any given poetic or musical rhythm the fundamental character of the movement was really defined by the *χρόνοι ποδικοί*. Enough of these had to appear in their proper order to make a distinct impression of their character; else the whole seemed to have too little regularity for verse or music. The only method of treatment by which the two systems of times could be put on the same level and treated together was not invented till centuries later. The times employed in ancient music could all be described and noted accurately enough by the method of Aristoxenos, if not always so simply as might be wished. But when in its further development the rhythm of instrumental music became much more intricate still, the old theory of the foot as determined by the ratio between arsis and thesis, either of which might stand first, was found quite inadequate; the modern theory of the measure, as determined by the number of beats and always beginning with a down beat, inevitably resulted. But we are not to disdain Aristoxenos for not discovering a method that his contemporaries would have thought still stranger and less acceptable than the one he followed. His method is intelligible, and is perfectly sound within its own sphere, however different from ours; and it contains such unmistakable recognition of elasticity in syllabic quantities that one cannot but wonder that this has been so little regarded.

So too of the doctrine of *ἀλογία*, which Aristoxenos thus describes:

Ὥρισται δὲ τῶν ποδῶν ἕκαστος ἤτοι λόγῳ τινὶ ἢ ἀλογίᾳ τοιαύτῃ, ἥτις δύο λόγων γνωρίμων τῇ αἰσθήσει ἀνὰ μέσον ἔσται. γένοιτο δ' ἂν τὸ εἰρημένον ὧδε καταφανές· εἰ ληφθείησαν δύο πόδες, ὁ μὲν ἴσον τὸ ἄνω τῷ κάτω ἔχων καὶ δίσημον ἑκάτερον, ὁ δὲ τὸ μὲν κάτω δίσημον, τὸ δὲ ἄνω ἥμισυ, τρίτος δέ τις ληφθείη ποὺς παρὰ τούτους, τὴν μὲν βάσιν ἴσην αὖ τοῖς ἀμφοτέροις ἔχων, τὴν δὲ ἄρσιν μέσον μέγεθος ἔχουσαν τῶν ἄρσεων. ὁ γὰρ τοιοῦτος ποὺς ἄλογον μὲν ἕξει τὸ ἄνω πρὸς τὸ κάτω· ἔσται δ' ἡ ἀλογία μεταξὺ δύο λόγων γνωρίμων τῇ αἰσθήσει, τοῦ τε ἴσου καὶ τοῦ διπλασίου. καλεῖται δ' οὗτος χορεῖος ἄλογος. (P. 292 f. Mor.; II § 20 W.)

That is: "Each of the feet is determined and defined either by a precise ratio or by an incommensurable ratio such that it will be between two ratios recognizable by the sense. What is meant may be made clear thus. First take two feet, one having the time of the up-beat equal to that of the down-beat, and each two-timed, the other having the down-beat two-timed and the up-beat half that. Then put beside these a third foot having the down-beat equal to the other two, but the arsis of a length between the other arses. The foot so described will have the up-beat irrational or incommensurable with reference to the down-beat; and the incommensurable ratio will be between two ratios that the sense distinguishes, namely 2 : 2 and 2 : 1. This foot is called an irrational choree." To guard against misunderstanding, Aristoxenos proceeds to point out analogies in the theory of pitch-intervals; but to make his comparison useful here would require too long and technical an explanation of that theory also. The point is that there also are certain intervals which, even though perhaps expressible by fractions, such as one-twelfth, and therefore *κατὰ τοὺς τῶν ἀριθμῶν μόνον λόγους ῥητά*, are yet not employed in

music and are not recognized by the sense as rational. Τὸ μὲν οὖν ἐν ῥυθμῷ λαμβανόμενον ῥητὸν χρόνου μέγεθος πρῶτον μὲν δεῖ τῶν πιπτόντων εἰς τὴν ῥυθμοποιίαν εἶναι, ἔπειτα τοῦ ποδὸς ἐν ᾧ τέτακται μέρος εἶναι ῥητόν. . . . φανερὸν δὲ διὰ τῶν εἰρημένων, ὅτι ἡ μέση ληφθεῖσα τῶν ἄρσεων οὐκ ἔσται σύμμετρος τῇ βάσει· οὐδὲν γὰρ αὐτῶν μέτρον ἐστὶ κοινὸν ἔνρυθμον. "Accordingly a time-interval that is taken as rational in rhythm must in the first place be one of those that fit into rhythmical composition, secondly it must be a rational fraction of the foot in which it is placed. . . . But it is clear from the foregoing that the arsis assumed, between the other arses in extent, will not be commensurable with the thesis; for they have no common measure that is employed in rhythm."

Westphal (Gr. Rhythmik, p. 131 ff.) takes ἀνὰ μέσον and μεταξύ to mean just half-way between, and gives for the irrational choree the ratio 2 : 1½. That assumption is not supported by the general use of the words μεταξύ and μέσος, nor by the context here. The common meaning of both words is simply between, somewhere between boundaries named or implied; if a greater precision was desired, some precisely defining word or phrase had to be added. Moreover, Westphal's interpretation is inconsistent with other statements of Aristoxenos. For the ratio thus obtained is ῥητός, not an ἀλογία, for it is simply the λόγος ἐπίτριτος, or 4 : 3. And that according to Aristoxenos is one of the ratios admitted in ῥυθμοποιία; for though he admits in συνεχῆ or continuous ῥυθμοποιία only the dactylic, iambic, and paionic, yet he expressly says, γίνεται δέ ποτε ποὺς καὶ ἐν τριπλασίῳ λόγῳ, γίνεται δὲ καὶ ἐν ἐπιτρίτῳ (Frag. ap. Psell. 9, p. 85 W.). Therefore the ratio 2 : 1½ is certainly a λόγος ῥητός, and hence cannot be what Aristoxenos intended

by *ἀλογία*. The ordinary meaning of *ἀνὰ μέσον* and *μεταξύ* is the only one admissible. An irrational foot was one in which the ratio between arsis and thesis was not expressible in small whole numbers and was not measured by the ear exactly, though it was recognized as being between the ratios 2 : 2 and 2 : 1 (possibly also between 2 : 2 and 2 : 3). Those simple ratios are readily distinguished by the ear, which can also affirm with certainty that a third ratio lies between them, without being able or caring to measure it more exactly. Such an indeterminate ratio between arsis and thesis constituted a *ποὺς ἄλογος*; a syllable thus breaking away from the ordinary precise numerical relation to its neighbors was *ἄλογος*.

But whether this or Westphal's understanding of the matter be accepted, the existence of irrational feet in either sense implies elasticity of syllabic quantity. An irrational syllable arises from the compression of a "long" syllable or the prolongation of a "short." A syllable which in one connection is two-timed becomes in another irrational; or else a syllable which in one connection is one-timed becomes in another irrational. A new collocation leads one to make the change, which the reader recognizes from the collocation alone. This is substantially what happens in English verse. In the lines,

> The curfew tolls the knell of parting day,
> The lowing herd winds slowly o'er the lea,

the arsis *winds*, and in a slightly less degree *-few*, are such that they do not allow compression to the shortest *χρόνος ποδικός*, that of such arses as *the* in any of its four occurrences. In other collocations either of them might be a full two-timed syllable; *winds* would admit

as great protraction as any syllable in the language. But here both are naturally spoken as something between one-timed and two-timed. Just what their time is, between those two limits, the rhythmic sense cannot determine and does not care; they are felt as retarding the time a little, thereby effecting a pleasant relief from the dull monotony of an arithmetical precision. They are ἄλογοι in the Aristoxenean sense.

That considerable class of syllables known as common are a still more familiar illustration of the same principle of rhythmization, — an illustration so conspicuous and so frequently recurring that even the metrici could not overlook it. For what is a common syllable but one that may at will be made long or short? It is to be remembered also that this class of common syllables includes many besides those in which a vowel naturally short is followed by a mute and liquid, of which the former may be placed now in one syllable now in the other. That explanation of the variable quantity can at best account for but a part of the cases. Partial loss of quantity in hiatus is another familiar change closely related to the variability of common syllables.

We have thus reviewed a series of phenomena described by Aristoxenos and others, the reality of which in Greek versification is beyond question. It does not seem to have occurred to any ancient observer to group them together under one principle. Yet plainly all are but different manifestations of a single force no less active in Greek and Latin speech than in our own, if we will look beneath the surface and see the real unity under external variety. The impulse to rhythmize, which acts on so many other materials, acted constantly in the speakers of Greek; it led them to put each combination of words, taken in larger groups, into as good a rhythm

as the material, all things considered, would allow. This impulse alone would suffice to keep spoken syllables of a living tongue more or less flexible. An interesting suggestion of this view of the matter, if nothing more than a suggestion, is preserved in the definition of 'versus' attributed to Varro (in Marius Vict., p. 55 K.). Versus, ut Varroni placet, verborum iunctura, quæ per articulos et commata et rhythmos modulatur in pedes. One is tempted on the basis of this to believe that Aristoxenos somewhere recognized this view even more distinctly than in the fragments known to us.

What then is really meant when certain syllables are called long and certain others are called short? A long syllable in Greek is one that does not admit sufficient compression to represent the χρόνος πρῶτος unequivocally. If by exception it occupies a position where the exact rhythmic pattern (ῥυθμός in Aristoxenos's narrower sense) leads us to expect a syllable that shall have only the time of the χρόνος πρῶτος, a long syllable retards the movement a little; it produces a time-interval, variable with circumstances, but in general incommensurable with the others, or ἄλογος. In the earliest period, and always in the most widely used verse, the dactylic hexameter, no long syllable is allowed to occupy such a position. In many kinds of verse a long was often allowed, within certain restrictions, to stand in place of a χρόνος πρῶτος, but with an effect of retardation; while it could fill a δίσημος χρόνος, or a three-timed or four-timed, with no suggestion of inadequacy. Thus a long syllable, if we take as a standard its most common length of two times, is capable of considerable extension but of only slight compression. A short syllable on the other hand cannot fill a δίσημος χρόνος unequivocally. If asked to do so, as it apparently was

occasionally in some meters, there was a slight inadequacy, a little hastening of the time. But it might in some circumstances be crowded into less than the χρόνος πρῶτος, two short syllables together having somewhat the effect of a long syllable in like position. A more detailed examination of such cases belongs elsewhere.

We have still to consider the relation between verse and prose, and must include in this examination another side than the rhythmical. For Westphal has so emphasized and insisted upon a marked difference between *gesagter* and *gesungener Vers*,[1] and that difference has been so widely adopted as proved, that we must follow the course of his argument closely enough to see where and why he erred.

The Allgemeine Theorie d. gr. Metrik begins with a translation and discussion of the remarks of Aristoxenos on the difference in movement of the speaking and the singing voice.[2] These remarks are combined erroneously with Frag. 6 in Psellos, perhaps from the first book of the Elements of Rhythm, so as to derive therefrom the conclusion that Aristoxenos made a sharp distinction between spoken verse and song as regards rhythm. This conclusion is then strengthened by an unwarrantable application of Dionysios Hal., De Comp. Verb. 17 and 20. We will take up only so much of this as is necessary for the purpose of finding and avoiding the error, and will begin with the Psellos fragment 6, which reads:

[1] Gr. Rhythmik, p. 42 ff., and Aristoxenos, I. p. 220 ff. Westphal and Gleditsch, Gr. Metrik, pp. 1–21.

[2] This topic has been gone over with great lucidity by Dr. C. W. L. Johnson, Trans. Am. Phil. Assoc. for 1899, Vol. XXX, pp. 42–55, who however confines himself strictly to exposition of the musical side, scarcely touching the rhythmical problem.

Τῶν δὲ ῥυθμιζομένων ἕκαστον οὔτε κινεῖται συνεχῶς οὔτε ἠρεμεῖ, ἀλλ' ἐναλλάξ. καὶ τὴν μὲν ἠρεμίαν σημαίνει τό τε σχῆμα καὶ ὁ φθόγγος καὶ ἡ συλλαβή. οὐδενὸς γὰρ τούτων ἔστιν αἰσθέσθαι ἄνευ τοῦ ἠρεμῆσαι· τὴν δὲ κίνησιν ἡ μετάβασις ἡ ἀπὸ σχήματος ἐπὶ σχῆμα, καὶ ἡ ἀπὸ φθόγγου ἐπὶ φθόγγον, καὶ ἡ ἀπὸ συλλαβῆς ἐπὶ συλλαβήν. εἰσὶ δὲ οἱ μὲν ὑπὸ τῶν ἠρεμιῶν κατεχόμενοι χρόνοι γνώριμοι, οἱ δὲ ὑπὸ τῶν κινήσεων ἄγνωστοι διὰ σμικρότητα ὥσπερ ὅροι τινὲς ὄντες τῶν ὑπὸ τῶν ἠρεμιῶν κατεχομένων χρόνων. νοητέον δὲ καὶ τοῦτο ὅτι τῶν ῥυθμικῶν συστημάτων ἕκαστον οὐχ ὁμοίως σύγκειται ἔκ τε τῶν γνωρίμων χρόνων κατὰ τὸ ποσὸν καὶ ἐκ τῶν ἀγνώστων, ἀλλ' ἐκ μὲν τῶν γνωρίμων κατὰ τὸ ποσὸν ὡς ἐκ μερῶν τινων σύγκειται τὰ συστήματα, ἐκ δὲ τῶν ἀγνώστων ὡς ἐκ τῶν διοριζόντων τοὺς γνωρίμους κατὰ τὸ ποσὸν χρόνους.

That is: "Each of the ῥυθμιζόμενα is neither in motion nor at rest continuously, but is both by turns. The period of rest is marked by the bodily position, the musical note, and the syllable, for no one of these can be perceived without the cessation of motion; the period of motion is marked by the transition from position to position, from note to note, and from syllable to syllable. The times occupied by the periods of rest are determinable, while the periods of motion are not determinable, because of brevity, serving as boundaries, as it were, to the times occupied by periods of rest. This too should be observed, that each of the systems of rhythm consists both of the times whose length is determinate and of those whose length is indeterminate, but not in like manner; the combinations consist of the known quantities as constituent parts and of the unknown quantities as separating and bounding the known."

The terms γνώριμος and ἄγνωστος are not easy to translate consistently, though their meaning is clear,

and is not obscured, I hope, by the above rendering. It is evident that *κινέω* and *κίνησις* have a broader application than our words 'move' and 'motion' and that *ἠρεμία* too receives a technical sense. The transition from one bodily position to another in the dance, that from one note to another in music, and that from one syllable to another in language, are so far analogous that all alike are called motion. In contrast with them the continuance in one bodily position, the remaining on one musical note, and the remaining within the limits of one syllable, are called rest, — not absence of sound, but absence of motion. To us the term rest appears least fitting in the case of syllables. It is entirely fitting in the case of the dance and not far-fetched when applied to musical tone. It must be granted that the application to syllables would seem to us easier if syllables in song alone were intended, as Westphal affirms. But against that assumption it must be said first that the passage contains no hint of such a restriction. There is nothing to suggest that the triad here thought of is any other than the familiar one of *κίνησις σωματική*, *μέλος*, *λέξις*, each in its fullest extent. Westphal introduced the restriction of *λέξις* here because he thought the other passage, to be considered later, required it. Again, if syllable did here refer only to the syllable as sung, the third case mentioned would be practically identical with the second. Syllable and note coincided in singing, except when two notes of different pitch were put for one long syllable. But this no more called for separate mention in so summary an account than did, under the second head, two successive notes of instrumental music on the same pitch, yet divided by an interruption, though this is another kind of *μετάβασις* than that from one pitch to a higher or lower. The transition from one

instrumental note to another on the same pitch is surely not excluded under the second head, for a rhythmic division is heard then as truly as when the pitch changes. And the mere difference of musical instrument, as between lyre or flute and voice, no more called for a separate clause than the difference between lyre and flute under the second case. In fact, a Greek could hardly fail — unless especially warned, as he is not here — to include sung syllables under *φθόγγοι*, which was applied primarily to language. This would strongly incline him to understand *συλλαβή* of the spoken syllable primarily. And finally, this figurative use of the term rest for the period of duration of any syllable, spoken or sung, is made perfectly intelligible by the analogy with the two preceding cases, of bodily movement and of musical notes, and by the contrast with the *μετάβασις* or transition. That passage from one syllable to the next, naturally enough called *κίνησις* from analogy with the other two *ῥυθμιζόμενα*, fully justifies the term *ἠρεμία* for the time of the syllable itself. Aristoxenos is aiming here, as often elsewhere, to bring out the essential identity of rhythm, and the close likeness between the manifestations of it, in all three arts, dance, music, poetry. Our better acquaintance with the physics of sound and articulation may make the transfer of terms appear more-strained than it appeared to him; but we must avoid judging his phraseology, when our object is to understand it, by a criterion created by knowledge that he could not have.

In all three arts, then, Aristoxenos considers the concrete rhythm as made up of the periods of *ἠρεμία* plus the periods of *κίνησις* or transition from one *ἠρεμία* to another. Both rest and motion, in this context, are periods of time, only differently occupied. But the

periods of rest are alone regarded by the sense as constituting the times of the rhythm; the transitions are rapid and brief, the rhythmic sense does not measure their time independently, but takes them merely as minute periods of separation between the ἠρεμίαι which it does measure, and which would not be distinguishable without the transitions. This accords perfectly with the facts, and is accurate enough for a general statement, such as Aristoxenos intended. Yet if we would make the description more minutely accurate, it could be improved by one slight modification.

This appears most plainly in the dance, where the terms 'rest' and 'motion' are not figurative but literal. Certainly in the dance as we know it, and without doubt generally, the periods of strict rest are scarcely present at all. The body as a whole, or in some prominent part, is almost constantly in motion; a part only — as one foot and then the other, or the arms or head and so on — in regular alternation or sequence comes to a brief rest, while other parts move. Take walking as the simplest example. The body as a whole is moving forward all the time; but the left foot, say, is brought to rest on the ground, and remains at rest — or part of the sole does — until the right is firmly planted; then the left is raised and moved forward, with very complex movement of the leg, and brought again to rest. This goes on with both feet alternately, one moving while the other rests; from the sole up the motion is constant, though regularly varied; for each foot looked at by itself the period of rest and that of transition are almost equal. How does the conception of Aristoxenos apply? Evidently in this way. The coming to rest of one foot is noted by the rhythmic sense as the beginning of a rhythmic time, which is felt to continue until the coming to

rest of the other foot marks the beginning of a new time; and for each foot separately a rhythmic time is felt to continue from the beginning of one contact with the ground until the beginning of the next contact. Those time-intervals are noted and measured against each other. But the period of transition for each foot is not independently noted and measured in that way; if felt at all as part of the rhythm, it is felt in a subordinate relation, and with no reference to its precise comparative duration. We come around to the same point that was reached by analysis of the play accompanying the jingle "Bean Porridge Hot." The times noted by the rhythmic sense extend from the beginning of one time to the beginning of the next or the corresponding time; what marks those beginnings marks the times; the transitions merely occupy a larger or smaller portion, scarcely or not at all noted as regards duration, of the rhythmic times.

It will be seen that this is hardly to be called a modification of the view of Aristoxenos; it only carries his description into minuter detail. His remark is accurate and touches the heart of the matter, when he says: "No one of these (*σχῆμα*, *φθόγγος*, *συλλαβή*) can we perceive — (i. e., detect its beginning or recognize it as a distinct entity) without a coming to rest" after a transition. That applies literally to the dance. And the term *ἠρεμία* once accepted for the musical note and the syllable, together with *κίνησις* for the transition from one note or syllable to the next, his statement of the brevity of the motion as compared with the period of rest requires no modification or explanation in regard to music and poetry.

We turn now to the difference in movement as between the speaking and the singing voice. At the very out-

set the fact must be obvious that movement or motion in this connection is something very unlike the motion we have just been considering. Both are called *κίνησις* by Aristoxenos, because language is limited; but the context should leave no room for ambiguity.

With most of Westphal's interpretation of the passage no fault is to be found. Aristoxenos proposes (Harm. p. 8 Mb.) to examine *τῆς κατὰ τόπον κινήσεως τὰς διαφοράς*, or the different ways in which the voice moves *κατὰ τόπον*. *Τόπος* is here, by metaphor, the range of pitch in the musical scale; it is the movement of the voice up and down that scale that is under examination; the aim is to differentiate the speech-tune from song proper. These are two kinds of tune, two kinds of movement up and down the scale. The speaking voice in general glides, as we say, from one pitch to another, without pausing on one pitch long enough to make a steady musical note, maintained at the same rate of vibration for an appreciable time. In singing, however, the voice instead of gliding moves up and down the scale by musical intervals; it stops an appreciable time on one note, passes as quickly as possible from that pitch to another, and stops there in like manner; and so on. The former mode of movement up and down the scale Aristoxenos calls *συνεχὴς* (continuous or uninterrupted) *κίνησις*, the latter he calls *διαστηματικὴ κίνησις*, movement by intervals, or discrete movement. The principal paragraph is this:

Κατὰ μὲν οὖν τὴν συνεχῆ τόπον τινὰ διεξιέναι φαίνεται ἡ φωνὴ τῇ αἰσθήσει οὕτως ὡς ἂν μηδαμοῦ ἱσταμένη[1] *μηδ' ἐπ' αὐτῶν τῶν περάτων κατά γε τὴν τῆς αἰσθήσεως φαντασίαν, ἀλλὰ φερομένη συνεχῶς μέχρι σιωπῆς, κατὰ δὲ*

[1] No *ἥ* is to be inserted as in Westphal's text; *ὡς ἄν* suggests an optative from *διεξιέναι*, not requiring to be expressed.

τὴν ἑτέραν ἣν ὀνομάζομεν διαστηματικὴν ἐναντίως φαίνεται κινεῖσθαι· διαβαίνουσα γὰρ ἵστησιν αὐτὴν ἐπὶ μιᾶς τάσεως εἶτα πάλιν ἐφ' ἑτέρας, καὶ τοῦτο ποιοῦσα συνεχῶς — λέγω δὲ συνεχῶς κατὰ τὸν χρόνον — ὑπερβαίνουσα μὲν τοὺς περιεχομένους ὑπὸ τῶν τάσεων τόπους ἱσταμένη δ' ἐπ' αὐτῶν τῶν τάσεων καὶ φθεγγομένη ταύτας μόνον αὐτὰς, μελῳδεῖν λέγεται καὶ κινεῖσθαι διαστηματικὴν κίνησιν.

"In the one, namely continuous movement, the voice appears to our senses to traverse a certain space as if not stopping[1] anywhere, not even at the upper and lower limits of the range, at least as the sense conceives it, but borne on continuously until it becomes silent. But in the other, which we name discrete movement, the voice appears to move in a very different manner. Passing over an interval it stops on one pitch, then again on a second; and doing this continuously — I mean continuously in time — skipping the intervals bounded by the notes but stopping on the notes themselves and sounding these only, it is said to sing a melody and to move by discrete movement."

These words are perfectly clear. The parenthesis *λέγω δὲ συνεχῶς κατὰ τὸν χρόνον* is thrown in because he has used *συνεχῶς* in two senses. With *φερομένη* the word *συνεχῶς* is used *κατὰ τόπον*, of the range of pitch, and means by glides, or without stopping on any intervening pitch, as the violin sounds when, as the bow is drawn, the finger slides, irregularly but without stopping anywhere, up and down the string. But with *τοῦτο ποιοῦσα* the word *συνεχῶς* is used *κατὰ χρόνον*, and means unceasingly, or without change; while *τοῦτο ποιοῦσα* means skipping intervals and stopping only on certain notes. The singing voice does that unceasingly. If in place of the second *συνεχῶς* Aristoxenos had said

[1] See note on preceding page.

ἀεί or πάντα τὸν χρόνον μέχρι σιωπῆς and omitted the parenthesis, the modern reader would not have misunderstood; but συνεχῶς is the usual word in this precise sense, and he thought his parenthesis removed all difficulty. To make the matter still plainer he goes on to repeat the explanation in slightly varied terms, which Westphal translates accurately, in harmony with the version above.

Now this passage from the Harmonica has no connection with the above Psellos fragment. One has to do with music alone, in the narrow sense of μέλος, the other with rhythm alone. Κίνησις in one refers to movement up and down the scale, κατὰ τόπον, with no regard to time; in the other κίνησις denotes the transition (μετάβασις) from position to position, note to note, syllable to syllable, which takes place κατὰ χρόνον, with no reference to τόπος. But Westphal unfortunately allowed himself to get befogged by the combination of four circumstances: — that κινέω plays an important part in both passages, that συνεχῶς also is important in both passages in close connection with κινέω, that συνεχῶς is employed in two senses, and especially, farther, that the ἠρεμίαι of the passage on rhythm are in one ῥυθμιζόμενον, μέλος, usually identical with the ἵστασθαι ἐπ' αὐτῶν τῶν τάσεων καὶ φθέγγεσθαι ταύτας μόνον. But even in μέλος the rhythmical ἠρεμία was not always identical with the continuance on the same pitch, for two or more successive notes might be perfectly distinct with no change of pitch between them; and it by no means follows that the ἠρεμίαι in the third ῥυθμιζόμενον, syllables, are also musical notes. That is Westphal's mistaken inference, which he is led into by that innocent parenthesis, λέγω δὲ συνεχῶς κατὰ τὸν χρόνον, which has no hearing on it, but is fully accounted for otherwise, as above. It is

that parenthesis which leads him to insist: "Auf der einen Seite gesungene Silben, auf der anderen Seite gesprochene Silben! In beiden Fällen sind es Silben und ihre Zeitdauer, um die es sich handelt." On the contrary, in the one passage it is exclusively the changes of pitch of syllables, not their Zeitdauer, which is in question; change of pitch only is meant by κίνησις there. The Psellos passage alone deals with time, and in all three rhythmic mediums alike. In the latter the μετάβασις, also called κίνησις, is said to be not determinable as regards duration, while the ἠρεμία is determinable. But the κίνησις in these cases does not refer to change of pitch at all; it coincides with change of pitch, even in singing, in only a part of the cases. When two successive syllables are sung to different notes, then change of pitch and the rhythmic μετάβασις from syllable to syllable coincide in time, as do the musical note and the rhythmic ἠρεμία. But suppose two successive syllables are sung on the same note. No change of pitch occurs. There is no κίνησις in the sense of the Harmonica passage. But the κίνησις in the sense of rhythmic μετάβασις is no less distinct than if a change of pitch had occurred; and the μετάβασις now is identical with that from syllable to syllable in speaking. In spoken syllables, on the other hand, as Aristoxenos here describes them, κίνησις in the sense of change of pitch occupies the time wholly, so that if the two κινήσεις were the same, there would be no ἠρεμίαι whatever to make even the ghost of a rhythm; but κίνησις in the sense of rhythmic μετάβασις is brief, is identical with the μετάβασις between successive syllables sung on the same pitch, and rhythm may be perfect.

In the above I have but followed Weil, whose refutation of Westphal the latter quotes (Rhythmik, p. 9 f.),

but only to defend his own view; and in general Weil's understanding of the matter seems to have been adopted by but few. My exposition has gone farther into detail in the hope — perhaps vain — of clearing up the confusion for some who would otherwise, without close examination, accept the view upheld by the great authority of Westphal and Gleditsch.

With this support removed, the doctrine of a sharp separation between the rhythm of song and that of spoken verse falls to the ground. We do indeed find, in the passages quoted in Chapter II on 'rhythmi' and 'metra,' evidence that the metrici made a separate class of the more elaborate lyric meters, as over against a class containing both the simpler lyric and all recitative verse. But that is not the same as a division between *gesagter* and *gesungener Vers*. Such a division as the metrici made is rather of itself evidence that the differences were merely of degree, not of kind, and were slight and gradual, in passing from spoken verse of the simplest sort to the most elaborate melic. The metrici drew the line at the point where the departure from their rule of two to one for long and short became too wide for their method to explain. And as between prose and recitative verse I do not know that any one has attempted seriously to maintain the existence of any distinction but one of degree.

The remarks of Dionysios Hal., De Comp. Verb., 17 and 20, we shall examine in another connection. But some sentences from 11 of the same work belong here. Dionysios has just said that an ordinary crowd in the theater expressed their displeasure at once, if a musician, however famous, made a trifling mistake, though perhaps no one of those offended could himself do correctly what he blamed the player for not doing. This, Dionysios

rightly says, indicates that we have a natural aptitude for music. Few have the technical knowledge required for artistic performance, but the faculty of passive appreciation is nature's gift to all. He then adds:

Τὸ δὲ αὐτὸ καὶ ἐπὶ τῶν ῥυθμῶν γινόμενον ἐθεασάμην, ἅμα πάντας ἀγανακτοῦντας καὶ δυσαρεστουμένους, ὅτε τις ἢ κροῦσιν ἢ κίνησιν ἢ φωνὴν ἐν ἀσυμμέτροις ποιήσαιτο χρόνοις, καὶ τοὺς ῥυθμοὺς ἀφανίσειεν. . . . μουσικὴ γάρ τις ἦν καὶ ἡ τῶν πολιτικῶν λόγων ἐπιστήμη, τῷ ποσῷ διαλλάττουσα τῆς ἐν ᾠδαῖς καὶ ὀργάνοις, οὐχὶ τῷ ποιῷ. καὶ γὰρ ἐν ταύτῃ καὶ μέλος ἔχουσιν αἱ λέξεις καὶ ῥυθμὸν καὶ μεταβολὴν καὶ πρέπον. ὥστε καὶ ἐπὶ ταύτης ἡ ἀκοὴ τέρπεται μὲν τοῖς μέλεσιν, ἄγεται δὲ τοῖς ῥυθμοῖς, ἀσπάζεται δὲ τὰς μεταβολάς, ποθεῖ δὲ ἐπὶ πάντων τὸ οἰκεῖον· ἡ δὲ διαλλαγὴ κατὰ τὸ μᾶλλον καὶ ἧττον.

"In the case of rhythms too I have seen the same thing happen,—a whole crowd together showing displeasure and indignation when one rendered a passage, either of instrumental music or dance or vocal utterance, in unsymmetrical or improperly proportioned times, and so destroyed the rhythms." If Dionysios stopped here one might suppose φωνήν to mean singing merely. But in fact, after insisting that variety and appropriateness are no less important than tune and rhythm, as one may see in vocal and instrumental music and in dancing, he proceeds: "And my comparison is not alien to the subject, for oratory was also a sort of music, differing from that of songs and instruments in degree, not in kind. For in oratory too the words have tune, rhythm, modulation, and appropriateness. So that in this too the ear is pleased by the melody, is moved by the rhythms, welcomes the changes, and everywhere desires appropriateness; the difference is in the more and less."

It is plain that to Dionysios the rhythms of prose

were like those of music; they lay in the *σύμμετροι χρόνοι* of successive syllables; a speaker might destroy the rhythms by giving to the times of the syllables wrong ratios, at which a large mixed audience would take offence. He then goes on, in a passage akin to the one cited from Aristoxenos, to describe the tune of speech, consisting of the prose accents; these disappear in singing, being replaced by the composer's melody, as he illustrates from a chorus of the Orestes. Later (p. 136 Schaefer) he calls a pleasing speech-tune, not of the singing but of the speaking voice, *εὐμελές* but not *ἐμμελές*; in like manner of rhythm, well ordered prose is *εὔρυθμος* but not *ἔρρυθμος*; *ἐμμελής* and *ἔρρυθμος* belong respectively only to music and verse. He then proposes to show how prose, by the very arrangement of words, may be made pleasing, not only in the speech-tune, in the variety of changes, and in appropriateness to the subject, but also *κατὰ τὰς συμμετρίας τῶν ῥυθμῶν*. Later in chapter 25 (p. 384 Schaefer), he explains excellently the difference between *εὔρυθμος* and *ἔρρυθμος*, thus:

Ἡ μὲν ὅμοια περιλαμβάνουσα μέτρα, καὶ τεταγμένους σώζουσα ῥυθμούς, κατὰ στίχον ἢ περίοδον ἢ στροφὴν διὰ τῶν αὐτῶν σχημάτων περαινομένη, κἄπειτα πάλιν τοῖς αὐτοῖς ῥυθμοῖς καὶ μέτροις ἐπὶ τῶν ἑξῆς στίχων ἢ περιόδων ἢ στροφῶν χρωμένη, καὶ τοῦτο μέχρι πολλοῦ ποιοῦσα, ἔρρυθμός ἐστι καὶ ἔμμετρος, καὶ ὀνόματα κεῖται τῇ τοιαύτῃ λέξει μέτρον καὶ μέλος· ἡ δὲ πεπλανωμένα μέτρα καὶ ἀτάκτους ῥυθμοὺς ἐμπεριλαμβάνουσα, καὶ μήτ' ἀκολουθίαν ἐμφαίνουσα αὐτῶν μήτε ὁμοζυγίαν μήτ' ἀντιστροφήν, εὔρυθμος μέν ἐστιν, ἐπειδὴ διαπεποίκιλταί τισι ῥυθμοῖς· οὐκ ἔρρυθμος δὲ, ἐπειδὴ οὐχὶ τοῖς αὐτοῖς οὐδὲ κατὰ τὸ αὐτό. τοιαύτην εἶναι δή φημι πᾶσαν λέξιν εὔμετρον, ἥτις ἐμφαίνει τὸ ποιητικὸν καὶ μελικόν· ᾗ δὴ καὶ τὸν Δημοσθένη κεχρῆσθαί φημι.

Accordingly his whole metrical section, describing and naming the feet, is as suitable to a handbook of metric as to a treatise on rhetoric. All the detailed discussions of prose rhythm, from Aristotle and earlier to Quintilian, assume the same thing without any perception on the part of their authors that a specific statement of it was needed.

On every side, in fact, in Greek as in English, language exhibits this unbroken gradation from the most careless to the most perfect artistic form. On the side of tone-quality and tune we may readily observe the progression. As the finer and more elevated emotions gain prominence, the tones of the voice — unless indeed the nature or violence of the emotion weakens the muscular control over the organs of speech — take on more and more of the pure quality that we call musical; appropriate passages of prose, still more of poetry, one may hear pronounced on the stage, and particularly by the best actresses, in the purest musical tone. Concurrently with this progression we may discern a parallel change in the speech-tune; where the purest tone is appropriate a good actress will frequently employ a form of true melody. Glides may be more prominent than is usual in acknowledged singing, but the whole will approach, as nearly as possible without attracting too marked notice, the character of a melody that could be written in our musical scales. Darwin has noted this in his Expression of the Emotions in Man and Animals (chap. IV): "From this fact [that an ape, one of the gibbons, produces an exact octave of musical sounds]," he says, "and from the analogy of other animals, I have been led to infer that the progenitors of man probably uttered musical tones [to express emotion] before they acquired the power of articulate speech; and consequently when the

voice is used under any strong emotion it tends to assume, through the principle of association, a musical character." Aristoxenos observed the same thing. In the discussion of the speaking and singing voice, just after the passage before considered, he says (p. 9 Mb.): "In talking we avoid holding the voice steady on any pitch, unless because of emotion we are forced to that kind of movement." This is a recognition of the fact that emotions cause the speaking voice to become more like the singing voice; greater steadiness of pitch and greater evenness in glides are accompanied by more musical quality of tone. In accordance with this remark of Aristoxenos we find that Aristides Q. (p. 7 Mb.) places beside the continuous and discrete movement of the voice a third kind, *μέση, ἥ τὰς τῶν ποιημάτων ἀναγνώσεις ποιούμεθα.* This is a valuable observation. It adds the fact, which accords fully with what we see in modern languages, that Greek poetry was read in a style that stood between that of conversation and that of singing, as regards tone-quality and pitch changes. The passage from the more commonplace and diffuse in thought or verbal expression to the more elevated, condensed, rich in ideas and emotion, was expressed also in the changed character of the vocal sounds, in the increase of the musical element.

Along with this went, as we saw in Chapter II, increased precision in the observance of rhythm. A high degree of this was called *πλάσμα*, which doubtless connoted the closer approximation to music in the other particulars besides rhythm. In all these aspects song stood at the upper end of the scale, which ran down, as with us, to the simplest prosaic utterance. In the latter, it is true, the ancients appear to have been hardly conscious of any approximation to rhythm. Their attention was attracted only by the conscious endeavor to produce

rhythm through selection and arrangement of words; their treatises were meant first of all for practical use in directing such endeavor, or at least in enabling one to understand the procedure and the product of such endeavor. There they recognized, at least the more acute minds recognized, the essential nature of the subconscious rhythmizing process dealing with material more or less plastic. That they failed to recognize the universality of the tendency to rhythmize, even where that conscious endeavor was not present, and that they sometimes conceived of the syllabic quantities in prose as rigidly fixed (as in the first sentence of the passage from Dionysios Hal. quoted above on p. 51) need not surprise us nor prevent our acceptance of a conclusion based on such an accumulation of evidence.

V

FOOT, ICTUS, "CYCLIC" FEET

ARISTOXENOS defines the foot by describing its function, in the words: *ᾧ σημαινόμεθα τὸν ῥυθμὸν καὶ γνώριμον ποιοῦμεν τῇ αἰσθήσει πούς ἐστιν εἷς ἢ πλείους ἑνός.* This follows, in our fragment of the Elements of Rhythm, a series of preliminary definitions. After reiterating with emphasis that rhythm deals with time, and arises only when there is an arrangement of times, he defines first the *πρῶτος τῶν χρόνων*, the *δίσημος χρόνος*, *τρίσημος*, etc., then simple and compound time in various relations, which involves a partial elucidation of *ῥυθμοποιία*. It is thus made as distinct as possible that the foot, which is treated next, is a matter of times, and only secondarily of syllables, notes, or steps, as these embody times.

The essence of the foot is that by it the rhythm is marked and made cognizable and intelligible. The active and middle voices of the two verbs are not accidental, but are designed to bring out the two aspects of the action. *Σημαινόμεθα* points within, to the mental process of apprehending, of noting to one's self as articulated in some definite way, the series of times concerned; *γνώριμον ποιοῦμεν* looks outward, to the action of making the articulation of the series perceptible to others. Both of these at once we do through the foot. Neither verb refers to beating time; that is merely an external aid to one or the other side of the process. The process is complete within the meaning of the defi-

nition whenever one simply renders the series of times, being conscious of its rhythmical character, so that another may also become conscious of it.

Evidently the foot is conceived as a sort of common measure of the series. The earlier name *μέτρον* embodies the same idea. When a rhythmical series is rendered, the times are perceived to be grouped, in larger and smaller divisions; that is what is meant by a *τάξις χρόνων*. Among these various divisions, and running through all with more or less distinctness, a group of times detaches itself to our sense, because it is often repeated, either in the same form or with so slight variation that we still feel the substantial identity. The group so repeated, with not too great variations, makes up the whole series and gives it a specific character, which varies with the character of the smaller group. To Aristoxenos any group of times recognized by our senses as performing that function is a foot. The smallest such group is a simple foot; if a group which performs that function is perceived to be itself made up of smaller groups which also perform the same function, then the larger of the two is a compound foot. The simple foot is the smallest unit of measurement — not group of times, but sufficiently repeated and distinctly characterizing group of times to constitute a unit of measurement — after the *πρῶτος χρόνος*.

The qualifying phrase "one or more than one" is added to the definition to cover the class known as dochmiac or "slantwise" rhythms.[1] Different kinds of

[1] Perhaps also the "logaœdic" or mixed meters. The difference between Westphal's conception and mine, with regard to the application of the phrase to that class of rhythms, will become clear if one cares to compare his Aristoxenos I, pp. 20–23, with my discussion of those meters in the next chapter.

simple feet were so combined in these that one alone was not sufficient to characterize the whole; each was distinctly felt, the frequent shifting from one to another within the kolon was an essential part of the effect. We have parallels in modern music. For example, there are some Hungarian popular songs in which the time shifts frequently, from measure to measure, so that a double indication of it has to be used, as $\frac{3}{4}$ $\frac{3}{4}$, or $\frac{6}{8}$ $\frac{6}{8}$. The characteristic movement of one may be seen in the phrase:

Rhythmically the whole song[1] consists of this kolon repeated six times with varying tune and harmony. A notable example of such combination is thus described by William Mason in his Memories of a Musical Life.[2] "Raff had composed a sonata for violin and pianoforte in which there were ever-varying changes in measure and rhythm; measures of $\frac{7}{8}$, $\frac{7}{4}$, $\frac{5}{4}$, alternated with common and triple time, and seemed to mix together promiscuously and without regard to order. Notwithstanding this apparent disorder, there was an undercurrent, so to speak, of the ordinary $\frac{3}{4}$ or $\frac{4}{4}$ time, and to the player who could penetrate the rhythmic mask the difficulty of performance quickly vanished." Mr. Mason goes on to tell how one of the musicians who had practised the sonata to play it before Liszt broke down from nervousness over the confusing changes, whereupon Liszt "played it through at sight in rapid tempo and without the slightest hesitation." Whether among

[1] Collection Litolff, No. 1281, Magyar Dal-Album, 214; others in the same volume are 226, 255, 294, 310, 391.

[2] Century Magazine, Sept. 1900, vol. lx, p. 775.

modern popular dances any such shifting rhythms exist I do not know; I should rather expect one might be found. There is probably no parallel in English verse; though the verse that originates and gains acceptance among the less cultivated, who are less bound by theory and follow the ear more boldly, certainly exhibits far more variety of rhythm than greater poets dare employ, and such verse has received no serious examination on this side. There can be no doubt that such rhythms were familiar to the Greeks, and therefore without the words *εἷς ἢ πλείους ἐνός* the defining sentence would not quite cover the ground. In our farther discussion, however, the dochmiac rhythms will for the present be left out of view.

The sentence that defines the foot is followed by the words:

Τῶν δὲ ποδῶν οἱ μὲν ἐκ δύο χρόνων σύγκεινται τοῦ τε ἄνω καὶ τοῦ κάτω, οἱ δὲ ἐκ τριῶν, δύο μὲν τῶν ἄνω ἑνὸς δὲ τοῦ κάτω, ἢ ἐξ ἑνὸς μὲν τοῦ ἄνω δύο δὲ τῶν κάτω [οἱ δὲ ἐκ τεττάρων, δύο μὲν τῶν ἄνω δύο δὲ τῶν κάτω]. ὅτι μὲν οὖν ἐξ ἑνὸς χρόνου ποὺς οὐκ ἂν εἴη φανερόν, ἐπειδήπερ ἓν σημεῖον οὐ ποιεῖ διαίρεσιν χρόνου· ἄνευ γὰρ διαιρέσεως χρόνου ποὺς οὐ δοκεῖ γίνεσθαι.

In English: "Some feet consist of two times, the up-time and the down-time; others of three, the up-times being two and the down-time one, or again of one up-time and two down-times; others of four, two up-times and two down. It is plain that a single time would not constitute a foot, because one *σημεῖον* does not effect a division of time; for without division of time there does not seem to be a foot."

As was remarked in an earlier chapter (p. 87) *χρόνος* cannot here mean the *πρῶτος χρόνος*. For a little later (p. 302 Mor.) Aristoxenos says: *Τῶν δὲ*

ποδῶν ἐλάχιστοι μέν εἰσιν οἱ ἐν τρισήμῳ μεγέθει. τὸ γὰρ δίσημον μέγεθος παντελῶς ἂν ἔχοι πυκνὴν τὴν ποδικὴν σημασίαν. It is true that Aristoxenos is here dealing only with feet that are employed in continuous rhythmopoiia, and he may have accepted the *δίσημος πούς* as an isolated occurrence, as at the beginning of the line in certain Aiolic meters. On the other hand, the context in the passage primarily under discussion (288 Mor.) shows that there too Aristoxenos is considering only the feet of continuous rhythmopoiia, not isolated and exceptional occurrences. He is still early in his treatise, at least early in that part of it which describes the rhythms of art, and his definitions and other statements are general, intended to set forth first the broad outlines, not the exceptional peculiarities. The foot, for example, is that *ᾧ σημαινόμεθα τὸν ῥυθμὸν καὶ γνώριμον ποιοῦμεν τῇ αἰσθήσει.* This has no application except to the feet of continuous rhythmopoiia; an isolated exceptional foot cannot be brought under it, and is called by the same name only by courtesy, — that is to say, by analogy, because language is limited. It is the feet to which that definition applies of which Aristoxenos immediately goes on to say that "some consist of two times," and so on. Besides it is not improbable, — it seems to me probable — that what the metrici called, in those Aiolic meters, a foot of two short syllables was really, to Aristoxenos, not strictly two-timed but irrational. It was restricted to the first place in rhythms of triple and quadruple time; the rhythmizing process would most naturally make it approximate in actual time to its neighbors. But however that may be — and we have no direct evidence for this explanation — on the former ground alone I consider it certain that Aristoxenos did not regard two strictly short syllables alone

as making a foot within the meaning of this passage, and that the feet of "two times, the up-time and the down-time," were more than *δίσημος*. The times here meant are the *χρόνοι ποδικοί*, the times which constitute the normal feet, excluding the modifications which *ῥυθμοποιία* may introduce. The expression is purposely kept general, to apply to *πόδες σύνθετοι* as well as to simple feet; but we shall avoid some risk of confusion if we look first at the application to simple feet only, and only in one medium, language. So restricted and so embodied *χρόνος ποδικός* becomes identical with syllable. The same use of *χρόνος* without the defining *ποδικός* appears in the Oxyrhynchos papyrus attributed to Aristoxenos. Τὸ *μονόχρονον οἰκειότερον τοῦ τροχαϊκοῦ ἢ τοῦ ἰάμβου* (col. iii.) must mean "the foot-space occupied by a single syllable (i. e., one *χρόνος ποδικός* only) is more appropriate to trochaic rhythm than to the iambus." Τὸ *μονόχρονον* is here a *τρίσημος* syllable, elsewhere it might be a *τετράσημος*; it is the largest *χρόνος ποδικός* — that is, the space of a whole foot, but undivided, consisting of one "time" only, because filled by a single syllable. Again in col. v, the *τετράχρονος κρητικὴ λέξις* is not a *τετράσημος* speech-form, containing four *πρῶτοι χρόνοι*, but a four-syllabled speech-form, $- \cup - \cup$, containing four *ποδικοὶ χρόνοι*, each represented by a syllable. Earlier in col. v the clause, *ὥστε τὴν μὲν πρώτην ξυλλαβὴν ἐν τῷ μεγίστῳ χρόνῳ κεῖσθαι, τὴν δὲ δευτέραν ἐν τῷ ἐλαχίστῳ, τὴν δὲ τρίτην ἐν τῷ μέσῳ*, employs *χρόνος* for *ποδικὸς χρόνος*, but in such a manner that the technical and the ordinary sense run together. So also in col. ii, *ὁ δάκτυλος ὁ κατ' ἴαμβον ἀνάπαλι τῶν περιεχουσῶν ξυλλαβῶν τεθεισῶν εἰς τοὺς χρόνους ἢ ὡς ἐν τῷ κρητικῷ ἐτίθεντο*, "the iambic dactyl (or dactyl with iambic thesis and arsis, $\cup - \cup -$), in which

the syllables comprising it (or constituent syllables) are set to the time-intervals in the reverse order as compared with the cretic (– ∪ – ∪)."

Adhering now to our restricted application, the meaning of the passage under consideration is this. There can be no foot without at least two syllables, for one syllable does not divide time and produce a ratio of times. A *μονόχρονον* among trochees is not strictly a foot, though its equivalent in time. Some feet consist of two syllables, one for the up-beat and one for the down-beat, (iambus, trochee, or spondee). Others consist of three syllables, two for the up-beat and one for the down (anapæst and dactyl); or again one for the up-beat and two for the down (– – ∪ and – ∪ –); others consist of four syllables, two for the up-beat and two for the down (paion – ∪ ∪ ∪, or ionic ∪ ∪ – – and – – ∪ ∪).

The foregoing appears to me the most probable solution of the long-standing and much-discussed problem, precisely what times Aristoxenos meant to include under the *χρόνοι ποδικοί*. In its favor, besides the simplicity of interpretation for this locus classicus, are three considerations, two positive and one negative.

First, the feet thus assumed as the normal ones, by which the rhythmical character of the series was determined and the beating of time was regulated, are adequate, filling all requirements. In them without exception each long syllable has twice the length of a short. All three *γένη*, namely *ἴσον*, *διπλάσιον*, *ἡμιόλιον*, are provided for fully, in every variety. All the other common feet are but slight variations of these, produced by resolution of a long syllable into two short, or union of two short into one long, or both together. These changes produce the simplest of the *χρόνοι τῆς*

ῥυθμοποιίας ἴδιοι. Trisemes and tetrasemes are also χρόνοι ποδικοί, provided they coincide with arsis, thesis, or whole foot; otherwise they are among the χρόνοι τῆς ῥυθμοποιίας ἴδιοι, farther varieties of which we need not dwell on at present.

Secondly, the term σημεῖον ποδικόν and most of the passages employing it are rendered more intelligible, at least as regards the simple feet. Besides the clause ἓν σημεῖον οὐ ποιεῖ διαίρεσιν χρόνου, where σημεῖον as applied to language is pretty clearly identical with syllable, the most significant passages are these.

(1) Ποδικὸς μὲν οὖν ἐστι χρόνος ὁ κατέχων σημείου ποδικοῦ μέγεθος, οἷον ἄρσεως ἢ βάσεως ἢ ὅλου ποδός. (Frag. 8 ap. Psell.) That is, in magnitude χρόνος ποδικός and σημεῖον ποδικόν are equal.

(2) Νοητέον δὲ χωρὶς τά τε τὴν τοῦ ποδὸς δύναμιν φυλάσσοντα σημεῖα καὶ τὰς ὑπὸ τῆς ῥυθμοποιίας γινομένας διαιρέσεις· καὶ προσθετέον δὲ ὅτι τὰ μὲν ἑκάστου ποδὸς σημεῖα διαμένει ἴσα ὄντα καὶ τῷ ἀριθμῷ καὶ τῷ μεγέθει, αἱ δ' ὑπὸ τῆς ῥυθμοποιίας γινόμεναι διαιρέσεις πολλὴν λαμβάνουσι ποικιλίαν. (Aristox., p. 292 Mor.) That is, the σημεῖα ποδικὰ determine or indicate the precise character of the foot, and continue unchanged, preserving that individual character of the foot under all the changes of the rhythmopoiia. The arrangement of times constituting the characteristic and fundamental foot of any rhythm remains and is felt as the substratum running through all the variations. In a similar way in modern music, say in common time, both conductor and players are conscious of the regular four beats, equivalent to quarter notes, of each measure, running along with and as it were underneath the endless variety of rhythm in the actual notes.

In poetry, and in reference to the simple foot, exclud-

ing for the present the Aristoxenean *σύνθετοι*, the doctrine is perfectly clear, if we take the smaller *σημεῖα* as equal to the syllables of the fundamental foot. In iambus, trochee, and spondee these lesser *σημεῖα* equal the arsis and thesis, and the largest *σημεῖον* equals the whole foot, in conformity with passage (1). But the word *οἷον* in (1) suggests, if it does not prove, that arsis, thesis, and whole foot do not exhaust the list of *σημεῖα ποδικά*. It leads us to expect in some feet other *σημεῖα* that do not coincide with arsis, thesis, or whole foot. And in fact the dactyl, anapæst, ionic, or cretic is not sufficiently characterized by indicating merely the magnitudes of the arsis, thesis, and whole foot. For example, that alone would make no distinction whatever between the dactyl or anapæst and the spondee; all three would have the same *σημεῖα*, which in that case could hardly be spoken of as *τὴν τοῦ ποδὸς δύναμιν φυλάσσοντα*. Where arsis or thesis of the fundamental foot is divided between two syllables, it would seem that each syllable must embody a *χρόνος ποδικός* and be represented by a *σημεῖον ποδικόν*, if the *σημεῖα* are really to indicate and preserve amid all variation the individuality of the foot. To this add:

(3) *Αὔξεσθαι δὲ φαίνεται τὸ μὲν ἰαμβικὸν γένος μέχρι τοῦ ὀκτωκαιδεκασήμου μεγέθους, ὥστε γίνεσθαι τὸν μέγιστον πόδα ἐξαπλάσιον τοῦ ἐλαχίστου, τὸ δὲ δακτυλικὸν μέχρι τοῦ ἑκκαιδεκασήμου, τὸ δὲ παιωνικὸν μέχρι τοῦ πεντεκαιεικοσασήμου. αὔξεται δὲ ἐπὶ πλειόνων τό τε ἰαμβικὸν γένος καὶ τὸ παιωνικὸν τοῦ δακτυλικοῦ, ὅτι [ἐν τῷ ἐλαχίστῳ ποδὶ] πλείοσι σημείοις ἑκάτερον αὐτῶν χρῆται. οἱ μὲν γὰρ τῶν ποδῶν δύο μόνοις πεφύκασι σημείοις χρῆσθαι, ἄρσει καὶ βάσει, οἱ δὲ τρισὶν ἄρσει καὶ διπλῇ βάσει, οἱ δὲ τέτρασι, δύο ἄρσεσι καὶ δύο βάσεσιν.* (Frag. 12 ap. Psell.)

That the last sentence is nearly related to the one from which our discussion of the *χρόνοι ποδικοί* set out (quoted above, p. 134) is obvious enough, and is strikingly brought out by Westphal's parallel columns (Rhythmik, p. 110 f.). As correlative terms we find in

Aristox., p. 288 Mor.	Psell. Frag.
ἐκ δύο χρόνων σύγκειται	*δύο σημείοις χρῆσθαι*
τοῦ τε ἄνω καὶ τοῦ κάτω	*ἄρσει καὶ βάσει*
ἐκ τριῶν	*τρισί*
δύο μὲν τῶν ἄνω	
ἑνὸς δὲ τοῦ κάτω ἢ	
ἐξ ἑνὸς μὲν τοῦ ἄνω	*ἄρσει καὶ*
δύο δὲ τῶν κάτω	*διπλῇ βάσει*
P. 290 Mor.	
οὐ γίνεται πλείω σημεῖα τῶν τεττάρων	*τέτρασι, δύο ἄρσεσι καὶ δύο βάσεσι*

The equality of *σημεῖα ποδικά* and *χρόνοι ποδικοί* is farther confirmed by this parallelism. The phrase *ἐν τῷ ἐλαχίστῳ ποδί* was added by Westphal, is unnecessary, and as regards *ἐλαχίστῳ* impossible, I believe; yet it is certainly most natural to suppose that the last sentence refers primarily to the list of fundamental simple feet. With that understanding there is no difficulty in the last sentence, and the causal clause before it becomes also a natural and rational statement. But we will first look at two other paragraphs that bear upon this.

(4) *Διαφέρουσι δὲ οἱ μείζονες πόδες τῶν ἐλαττόνων ἐν τῷ αὐτῷ γένει ἀγωγῇ. ἔστι δὲ ἀγωγὴ ῥυθμοῦ τῶν ἐν τῷ αὐτῷ λόγῳ ποδῶν κατὰ μέγεθος διαφορά, οἷον ὁ τρίσημος ἰαμβικὸς ὁ [σημεῖον] συνέχων [ἓν] ἐν ἄρσει καὶ διπλάσιον ἐν θέσει [καὶ ὁ ἑξάσημος ἰαμβικὸς ὁ σημεῖα δύο συνέχων*

ἐν ἄρσει καὶ διπλάσιον ἐν θέσει]. *τῶν γὰρ τριῶν ἡ διαίρεσις εἰς* [*ἓν*] *σημεῖον καὶ διπλάσιον γίνεται τῶν τε ἓξ ὁμοίως. οὗτοι οὖν οἱ πόδες, μεγέθει ἀλλήλων διαφέροντες, γένει καὶ τῇ διαιρέσει τῶν ποδικῶν σημείων οἱ αὐτοί εἰσιν.* (Excerpta Neap. 15, p. 415 Jan.)

(5) *Τοῦ δὲ λαμβάνειν τὸν πόδα πλείω τῶν δύο σημεῖα τὰ μεγέθη τῶν ποδῶν αἰτιατέον. οἱ γὰρ ἐλάττους τῶν ποδῶν, εὐπερίληπτον τῇ αἰσθήσει τὸ μέγεθος ἔχοντες, εὐσύνοπτοί εἰσι καὶ διὰ τῶν δύο σημείων· οἱ δὲ μεγάλοι τοὐναντίον πεπόνθασι, δυσπερίληπτον γὰρ τῇ αἰσθήσει τὸ μέγεθος ἔχοντες, πλειόνων δέονται σημείων, ὅπως εἰς πλείω μέρη διαιρεθὲν τὸ τοῦ ὅλου ποδὸς μέγεθος εὐσονοπτότερον γίνηται. διὰ τί δὲ οὐ γίνεται πλείω σημεῖα τῶν τεττάρων οἷς ὁ ποὺς χρῆται κατὰ τὴν αὐτοῦ δύναμιν ὕστερον δειχθήσεται.* (P. 290 Mor.)

In (4) the reading *ὁ σημεῖον συνέχων* is practically certain; but the following *ἕν*, and *ἓν* in line 7, are no more needed than is *μιᾷ* in the phrase *ἄρσει καὶ διπλῇ βάσει* in the last sentence of (3). Something like the words *καὶ ὁ ἑξάσημος ἰαμβικός κ.τ.λ.*, added by Westphal, must have stood there, otherwise *τῶν τε ἓξ ὁμοίως* would be inexplicable; but Westphal wrote *διπλάσιον* in the singular because he assumed that only one *σημεῖον* could stand for the thesis. With *διπλάσια*, or *δύο διπλάσια*, the whole becomes consistent with itself and with the rest. Finally *ἀγωγή*, as Jan remarks, evidently does not here mean tempo, as it often does, but rather length, or the amount of time given to the foot. Our musical nomenclature, borrowing tempo from Italian, conveniently distinguishes concepts that are yet closely enough related to allow the Greek, though with some loss of clearness, to employ the same term for both.

The meaning of (4) then is this. "The larger feet differ from the smaller of the same class in *ἀγωγή*. The

meaning of rhythmic *ἀγωγή* is variation in length between the feet in the same class; for example, the three-timed iambic, which contains a *σημεῖον* in arsis and a double one (one twice as long) in thesis, and the six-timed iambic, which contains two *σημεῖα* in arsis and two of double length in thesis. For the three [*πρῶτοι χρόνοι*] are divided into a *σημεῖον* and one of double length, and the six likewise (into two *σημεῖα* and two of double length). These feet, therefore, though differing from each other in extent (*μεγέθει* here practically the same as *ἀγωγῇ*), are the same in class and in the division of the *ποδικὰ σημεῖα*." By the six-timed iambic we are to understand primarily ∪ ∪ — — or — — ∪ ∪, probably also the iambic or trochaic dipody ∪ — ∪ — or — ∪ — ∪.

Passage (5) fits least easily into this interpretation. At first sight the phrasing of the opening sentence may appear a trifle unnatural in reference to the fundamental feet. My hesitation on that score has been overcome, however, by two considerations. On the one hand *λαμβάνειν* and *αἰτιατέον*, the centers of difficulty, need not be pressed to mean anything more than *ἔχειν* and *αἰτία*. On the other hand, here as elsewhere the language is general, to apply not only to the fundamental feet but also to the *σύνθετοι πόδες*, the long feet of sixteen, eighteen, and twenty-five times referred to in (3). In reference to those the phraseology is wholly appropriate, and Aristoxenos may well have had these chiefly in mind in this sentence, though it applies to the fundamental feet as well. The difficulty, therefore, ceases to be serious and the whole may be rendered thus: "The reason for giving the foot more than two *σημεῖα* lies in the extent of the feet. The lesser feet, whose extent is easy for the sense to grasp, are readily comprehended in one view

through the two σημεῖα. But the opposite is true of the large feet. As their extent is difficult for the sense to grasp, they need more σημεῖα, in such wise that the extent of the whole foot, being divided into more parts, may more readily be comprehended in one view. Why there are never more σημεῖα than the four which the foot has in virtue of its own characteristic form will be shown later." The later explanation is lost.

In the last sentence the antecedent of οἷς has been taken to be σημεῖα. So far as the grammar of this sentence goes, it might be so. But τῶν τεττάρων [σημείων] would seem to be the more natural antecedent, from the purely grammatical standpoint. The former has been preferred as fitting a preconceived interpretation; the argument for the latter, besides the very slight one of grammatical probability based on order, in that it produces harmony of meaning with the other passages that point to four σημεῖα in the ionic and paionic. The four σημεῖα of the largest fundamental feet are never exceeded in number in the multiples of those feet, in the μεγάλοι πόδες of eighteen and twenty-five primary times.

In the light of (4) and (5) the whole of (3) is now clear. In English: "In extent of the foot the limit of the iambic class is eighteen primary times, so that the largest foot becomes in extent the sixfold of the smallest; in the dactylic class it is sixteen primary times, in the paionic twenty-five. The iambic class and the paionic increase to a larger number of primary times than the dactylic, because each of them has more σημεῖα ποδικά" — that is, in the fundamental foot into which the compound foot is divided. The scale would be

Foot	Σημεῖα	Number
Iambus	∪ –	2
Trochee	– ∪	2
Spondee	– –	3
Dactyl	– ∪ ∪	3
Anapæst	∪ ∪ –	3
Cretic	– ∪ –	3
Paion	– ∪ ∪ ∪	4
Ionic	– – ∪ ∪	4

Obviously the argument is not quite complete without one farther assumption, which is, I believe, justifiable. Not only were ionic kola extended to eighteen times, with and without anaklasis, but also the plain iambic and trochaic. The argument therefore does not cover the ground unless we may understand that Aristoxenos counted as fundamental feet for this purpose the iambic and trochaic dipody. That is possible enough. We are by no means fully informed as to the details of his nomenclature; but he appears to have given to these forms, at least in some connections, the distinctive names δάκτυλος κατ' ἴαμβον and κρητικός respectively.[1] Also, they were of very frequent occurrence mingled with ionics and precisely equivalent to them, while the longer iambic and trochaic kola were regularly measured and named on the assumption that what we call the dipody was the unit. With this addition to the scale the figures harmonize. A further reason for the addition will appear shortly.

But the causal connection (ὅτι) is not so plain and has been considered absurd. Westphal (Rhyth., pp. 113–117) followed Baumgart in rejecting it, finding the only rational explanation of the limits of extent for the

[1] See Oxyrh. Pap., col. ii, and Aristid. Q., i. 17.

compound feet in Aristid. Q., p. 35 Mb. We are there told simply that the dactylic class stops at the sixteen-timed kolon *διὰ τὸ ἐξασθενεῖν ἡμᾶς τοὺς μείζους τοῦ τοιούτου γένους διαγιγνώσκειν ῥυθμούς*; that the iambic stops at eighteen times, *οὐκέτι γὰρ τῆς τοῦ τοιούτου ῥυθμοῦ φύσεως ἀντιλαμβανόμεθα*; while the paionic extends to twenty-five times, *μέχρι γὰρ τοσούτου τὸν τοιοῦτον ῥυθμὸν τὸ αἰσθητήριον καταλαμβάνει*. But is not this in perfect accord with the Psellos fragment, the two supplementing each other? Our power to grasp a rhythmical series as an organized whole depends on the character of its divisions. The simpler those are, the sooner in point of time, when a succession of them meets the sense, do we cease to organize them into a new whole and begin to receive them as a mere unorganized succession. The principle is general; it applies perfectly to the case before us. A unit of two foot-times or *σημεῖα* is the very simplest in rhythm; hence very soon, before six such units are heard, the mind ceases to organize them and group them, so as to view the series mentally all together (*συνορᾶν*) as one. Unless, be it added, they are so constituted that the mind naturally groups them by twos, and so forms a larger unit than the original one of two *σημεῖα*. That was the case for the Greek with the common iambic and trochaic rhythms. Each alternate simplest foot admitted an irrational syllable, a variation in structure that of itself made a dipodic grouping; and whether the irrational syllable was there or not, the dipodic grouping was generally made. This larger unit, with four *σημεῖα*, might be repeated to form a series of three; the mind would still organize them and be conscious of them as a larger whole up to eighteen primary times. That this theoretical explanation agrees with the practical treatment of such series no

one can doubt; our addition of the iambic and trochaic dipodies to the scale of feet and σημεῖα is thus confirmed. The dactyl, however, with only three σημεῖα, could be so organized and unified only to the limit of four feet, sixteen primary times.[1] The anapæst followed the dactyl in this, in spite of the fact that for some reason, perhaps merely because of the connection with the double step in marching, anapæstic verse was counted and named by dipodies. Yet the anapæstic tetrameter was a very common group, though felt to be divided into two members. Ionic rhythms naturally were subject to like conditions with others of the iambic class, having the same number of σημεῖα as the iambic or trochaic dipody. The paion, with four σημεῖα, and with arsis and thesis in the peculiar ratio of two to three, had a more complex organization still; it could be extended to five feet or twenty-five times without failure of the unifying faculty. There is plainly a connection between the ratio of two to three within the foot and the number of five feet.

(6) Three other remarks of Aristides Q. must not be overlooked. In the first chapter of his section on rhythm (p. 32 Mb.) he says: "The rhythm is divided in speech by the syllables, in music by the ratio between arsis and thesis, and in bodily movement τοῖς τε σχήμασι καὶ τοῖς τούτων πέρασιν ἃ δὴ καὶ σημεῖα καλεῖται." His whole treatment of rhythm is so brief that it is difficult to say whether the antecedent of ἃ is πέρασιν or σχήμασι καὶ πέρασι, or in what precise sense πέρασιν is here em-

[1] How we are to explain the apparent discrepancy between this statement and the unquestionable occurrence of dactylic pentapodies I do not yet know. In such a case as αἴλινον αἴλινον εἶπέ, τὸ δ' εὖ τικάτω a modern musician would certainly prolong the last two syllables to tetrasemes; if the Greek musician did the same, he would regard the whole as of two kola.

ployed. The parallel expression in Aristoxenos is *διαιρήσει τὸν χρόνον . . . ἡ κίνησις σημείοις τε καὶ σχήμασι καὶ εἴ τι τοιοῦτόν ἐστι κινήσεως μέρος* (p. 278 Mor.). Here the context indicates that *σημεῖα*, *σχήματα*, and *τοιοῦτόν τι μέρος κινήσεως* are meant to include all varieties of divisions in the dance, from the smallest unit to the largest, by no means restricting *σημεῖα* to the smallest. The next section of Aristides begins: *πρῶτος μὲν οὖν ἐστι χρόνος ἄτομος καὶ ἐλάχιστος, ὃς καὶ σημεῖον καλεῖται.* Aristides, then, applied the term *σημεῖον* to the *πρῶτος χρόνος*; and he goes on to explain that this use of *σημεῖον* is analogous to that in geometry, the *πρῶτος χρόνος*, like the 'point,' being *ἀμερης*. *οὗτος δὲ ὁ ἀμερὴς μονάδος οἱονεὶ χώραν ἔχει· θεωρεῖται γὰρ ἐν μὲν λέξει περὶ συλλαβήν, ἐν δὲ μέλει περὶ φθόγγον ἢ περὶ ἓν διάστημα, ἐν δὲ κινήσει σώματος περὶ ἓν σχῆμα.* Either here is a partial confusion of thought, or else what looks like that is merely the result of his brevity. The latter is more probable, and in that case the explanation would be this. Aristides distinctly does not say that this use of *σημεῖον* is borrowed from geometry, but only that it is analogous to the use in geometry. His phrase is *καθὸ καὶ οἱ γεωμέτραι τὸ παρά σφισιν ἀμερὲς σημεῖον προσηγόρευσαν*; geometers and writers on rhythm have used the same term for a similar reason. Nor does *ἀμερής* necessarily mean indivisible, or without parts in the mathematical sense; the application of it in that sense to so large a portion of time as the *πρῶτος χρόνος* would be very strange. It is merely undivided, treated as one. Our term for the geometer's *σημεῖον* is point, a word of very different associations. It would be rather absurd for us to apply this to so long a time-interval as that of a syllable; but of course we must not without specific warrant connect with the *σημεῖον* of the rhythmici that notion of

minuteness which we connect with the word point in geometry, since point is merely our modern substitute for the Greek geometer's *σημεῖον*. And finally the phrases *περὶ φθόγγον ἢ περὶ ἓν διάστημα* and *περὶ ἓν σχῆμα* almost absolutely negative the restriction of *σημεῖον* in rhythm to the primary time alone. If that restriction was intended, it is strange that we find neither *βραχεῖαν* with *συλλαβήν* nor any corresponding restrictive word to show that *σημεῖον* was applied to the shortest note alone or the smallest interval of the scale or the shortest dance-figure alone. It seems far more probable that Aristides applied the term to any undivided time-interval such as Aristoxenos called a *χρόνος ποδικός*. So understood, his remarks here accord with our previous results; and in the sentence first quoted in this paragraph the antecedent of *ἅ* is probably *τοῖς σχήμασι καὶ τοῖς τούτων πέρασι* as one idea, equivalent to "the various dance-figures with their distinctly marked limits." One other remark, however, does not so accord in its present form. At the end of 16 (p. 38 f. Mb.) Aristides explains the name *παίων διάγυιος* for — ∪ — by saying: *διάγυιος μὲν οὖν εἴρηται οἷον δίγυιος (δύο γὰρ χρῆται σημείοις)*. As it stands, the last clause fits no interpretation of *σημεῖα* that I am acquainted with. If we assume one *σημεῖον* for thesis and one for arsis — and in no other sense does the *παίων διάγυιος* contain two only — then every foot is equally *δίγυιος* and the name *διάγυιος* is in no way distinctive. The foot — ∪ — may be called "two-limbed" naturally enough, but only by virtue of having two equal long syllables disposed symmetrically in relation to the central short, one or either side. Something like that the explanatory parenthesis must originally have said; but what the original wording was it is vain to guess.

(7) Marius Vict. contributes another slender ray of light. Early in his section on feet he inserts the sentence (p. 43 K.): Σημεῖον autem veteres χρόνον, id est tempus, non absurde dixerunt ex eo, quod signa quaedam accentuum, quae Græci προσῳδίας vocant, syllabis ad declaranda temporum spatia superponuntur, unde tempora signa Græci dixerunt. If we take χρόνον as meaning χρόνον ποδικόν, this not only agrees with Aristoxenos but supplies a more probable explanation than that of Aristides as to how this use of σημεῖον arose. Marks indicating rhythmic times were no less truly musical in character than those which we know as accents, indicating pitch; the name προσῳδίαι, accentus, naturally enough included both. The practice of using such marks of time when needed (as in the Seikilos epitaph, Jan., p. 452) led to calling the times σημεῖα. Our word 'note' has undergone a similar transfer of meaning.

In addition to these two positive arguments in favor of this understanding of Aristoxenos's χρόνοι ποδικοί, there is, thirdly, a negative consideration of some value. That understanding of the matter, though it does not of itself solve the remaining half of the problem — namely, what were the χρόνοι ποδικοί in the compound feet? — at least introduces no greater difficulty than other interpretations. Rather it seems to me to point towards a solution. But sufficient evidence for a really satisfactory solution probably does not exist. For that and other reasons a more detailed examination of the question is beyond the scope of this chapter, the object of which is to obtain a clear conception of what the Greeks, and in particular Aristoxenos, understood to constitute the essential nature of the ordinary feet. That appears to me to be the basis, or an essential part of the basis, on which must rest our understanding of individual meters, which latter we must

understand, if we would truly know the Greek poets on the side of their poetic form.

The next point made by Aristoxenos in characterizing the foot is its division into arsis and thesis, and the relation of these to each other. The paragraph is quoted and discussed in the preceding chapter (p. 110 f.). Further, among the *ποδικαὶ διαφοραί*, or modes in which feet differ, the second and third depend on *γένος*, as determined by the ratio between arsis and thesis (298 Mor.). The ratio 2 : 2 marks the dactylic class, that of 1 : 2 the iambic, that of 2 : 3 the paionic; and over against these three classes as one group, that of the rational feet, are set the irrational feet as another group. Also, frag. 11 from Psellos reads: *ἔστι δὲ καὶ ἐν τῇ τοῦ ῥυθμοῦ φύσει ὁ ποδικὸς λόγος ὥσπερ ἐν τῇ τοῦ ἡρμοσμένου τὸ σύμφωνον.* The comparison is just, and is one phase of the same fact which was emphasized on an earlier page, that rhythm and tune are alike in having to do with fairly simple ratios, which a trained ear can recognize and estimate in the one case no less than in the other. Two notes produced by strings vibrating at the same rate are in unison; if the vibrations are to each other as one to two, we have the concord of the octave; if as two to three, we have the concord of the fifth. These are the primary and perfect concords, corresponding to the ratios between arsis and thesis in the fundamental rational feet. In contrast with these rational feet the indeterminate ratio between arsis and thesis does indeed mark a distinction in character; but in two important respects the rational and irrational feet belong together. First, irrational feet were employed only in connection with the rational, not forming by themselves irrational meters (which would be simply unrhythmical) but mingled with the rational and so varying the too

monotonous flow. It is true we nowhere find this explicitly stated in our fragments; but so many things imply it that one can hardly doubt it. Secondly, the irrational feet were themselves classed in γένη corresponding to those of the rational feet with which the irrational feet were used, and were named accordingly. This is a reasonable inference from such a distinct example as the description in Aristides Q. (p. 39 Mb.) of the ἄλογος χορεῖος ἰαμβοειδής and τροχαιοειδής. Nomenclature probably varied on this as on so many other points; but it is in no way inconsistent with the letter or spirit of what we have from Aristoxenos to speak of irrational iambi, trochees, dactyls, anapæsts, and so on. In practice much confusion and misunderstanding would be avoided if all would use such terms with care, observing strictly the character of the rational feet among which the irrational ones occur, and never applying the term spondee, e. g., without qualification, to an irrational trochee or iambus, or the term dactyl to the irrational choree of Aristides.

The importance of arsis and thesis in the Greek theory, the distinctness with which they were felt as constituent and essential portions of the foot, carried with it important consequences. It explains why a foot-time occupied by a single prolonged syllable was to them not a foot; while to us, in our music, a whole measure so occupied by a single note is as true and normal a measure as any, and this in spite of the fact that modern musicians distinguish arsis and thesis in the measure, naming them in Greek fashion and with the Greek names. The division is real; but the development of music independently of verse has left that division in the background, while to the Greeks it loomed in the foreground very large. It explains also why the ancients felt no need of what appears to us a very

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great simplification, for modern music indispensable — I mean the method of so dividing into feet or measures that each measure begins with a down-beat. Without that our music would be intolerable complicated. The adoption of that method may be placed on a par, in the development of music, with the invention of the musical staff; the substitution of the Arabic numerals for the Greek or Roman was an advance of similar kind, and not so very much greater, in arithmetic. But to the Greeks arsis and thesis were no less distinct entities than the foot; they were so far independent that within the foot one order for those parts was as good as the other. If therefore a line began with an up-beat, the natural thing seemed to be to regard that and the following down-beat as a foot, and so divide the rest of the line; if another rhythm in the same class, iambic say, began with a thesis, then it was equally natural to put with it the following arsis for the first foot, and divide the whole on that basis. Do not the darkness and the light make a complete day no less than the light and the darkness? Then too there were differences of ethos and of treatment between rhythms that began with an arsis and those of the same class but beginning with a thesis. Those differences demanded a partially separate description of such rhythms, and were a positive ground, for them amply sufficient, for the differentiation in the division into feet. Like differences of ethos and treatment are present in our music, but the Greeks made more of them than we do. They can all be described no less readily and simply under our system of division into measures, which gets rid of some complications inseparable from the ancient method. Take as a simple example the paroemiac line as sung, in

ἔστ' ἂν παμφεγγεῖς ἄστρων
ῥιπὰς λεύσσω δὲ τόδ' ἦμαρ.

By the ancient theory the syllables δὲ τόδ' ἦ- are plainly an anapæst. But -μαρ is a thesis; by omission of the intervening arsis, needful to make a complete foot, the preceding anapæst is changed. The syllable ἦ- becomes a tetraseme, in this case not a ποδικὸς χρόνος but αὐτῆς τῆς ῥυθμοποιίας ἴδιος, extending beyond the limit of its proper foot. Thus arises an abnormal anapæst ∪ ∪ ⏑, equivalent in time to an ionic a minore, though any ancient, whether metricus or rhythmicus, would have called it simply an anapæst. If now we compare this peculiar anapæst, τὰς ὑπὸ τῆς ῥυθμοποιίας διαιρέσεις, with τὰ τὴν τοῦ ποδὸς δύναμιν φυλάσσοντα σημεῖα, which, as Aristoxenos says, διαμένει ἴσα ὄντα καὶ τῷ ἀριθμῷ καὶ τῷ μεγέθει, we have the dividing line between the normal fundamental feet occurring in the middle of the syllable. All this is intelligible enough to one who is accustomed to the Greek way of looking at it; but such a person no longer realizes how very confusing it is to a beginner. Yet this is one of the simplest of such cases. By our method of division into measures the difficulty vanishes, and the line becomes — | — — | — ∪ ∪ | ⏑ | —. The character of the rhythm is the same, the ear receives it as the same, under either method. The results of addition, multiplication, or division of numbers were the same under Greek or Roman notation as under the Arabic. But the difference in convenience is great in favor of the Arabic. Yet it must in fairness be added that one may not unreasonably doubt whether, all things considered, starting as we do with the Greek terminology and traditional method well established, the change to the method of our music would really simplify doctrine. Personally I think it would, if the change were once carried through. The practical advantage in so dividing as to make each foot begin with the

down-beat arises from the fact that this brings before the eye in writing the same relations that are noted by the ear in listening and were marked to the eye by the leader of the chorus in beating time. Using the accent mark on the thesis effects the same result, but there is a gain in bringing to bear on a confusing subject the conceptions and habit already familiar in our musical notation. And yet the necessity of constantly recurring to the ancients and reinterpreting their statements into the new form would furnish a new source of difficulty for the student, and that difficulty should not be underrated. Meantime, our first object is to understand the ancient system; there has been too little recognition of the manner and degree in which the rest of the system has been shaped by the conception of arsis and thesis.

Later definitions and descriptions of the foot, in Greek and Latin metrici, are mostly in pretty close agreement with that of Aristoxenos. Aristides Q. (p. 34 Mb.) has this: Ποὺς μὲν οὖν ἐστι μέρος τοῦ παντὸς ῥυθμοῦ, δι' οὗ τὸν ὅλον καταλαμβάνομεν. τούτου δὲ μέρη δύο, ἄρσις καὶ θέσις. Among the definitions discussed by Hoerschelmann (Ein gr. Lehrbuch der Metrik, pp. 25 ff.) are these: Πούς ἐστι μετρικὴ συλλαβῶν θέσις [σύνθεσις?] ἀπὸ δύο ἕως ἓξ ἐξ ὧν γνωρίζομεν τὸ τοῦ μέτρου εἶδός τε καὶ μέγεθος. Also πούς ἐστι μετρικὸν σύστημα συλλαβῶν ἐν αἷς γνωρίζομεν τὸ τοῦ μέτρου εἶδός τε καὶ μέγεθος. Hephaistion gives us no definition of the foot, but only statements of what combinations of syllables make up the several feet. The same is true of most of the Latin metrici as far as they are extant; but in Marius Vict. we find (p. 43 K): Pes est certus modus syllabarum, quo cognoscimus totius metri speciem, compositus ex sublatione et positione. It is clear that all these, so far as they go, are but near or remote echoes of Aris-

toxenos; the substance of the definition may not improbably be still older. It is not too much to say that throughout antiquity all extant definitions of the foot which we can regard as containing any sound principle, over and above a mere enumeration of syllables and times, assume as the essence of the foot one thing, namely, its function of marking and making intelligible the character of the rhythm.

On the other hand, no ancient definition says anything explicitly about that which most modern writers take as the very basis, namely stress. For example, Christ (Metrik², § 69): Bei jedem Fuss oder Takt unterscheidet man zwei Theile, den guten Takttheil, der mit verstärkter Stimme gesprochen wird, und den schlechten Takttheil, bei dem die Intention der Stimme nachlässt. Durch das Zeitverhältniss, das zwischen den beiden Takttheilen stattfindet, bestimmt sich die besondere Eigenschaft des Fusses. Es definiren daher auch die Rhythmiker, nach dem Fragm. Paris. 6, den Fuss mit: ὁ ποὺς λόγος τίς ἐστιν ἐν χρόνοις κείμενος. Christ is here, as usual, nearer to the ancients than many moderns are; yet the essence of his statement lies in the 'verstärkte Stimme' on a 'good' or 'strong' part of the foot and a remission of stress in pronouncing another part, that is by comparison 'poor' or 'light' or 'weak.' In like manner Westphal (Rhythmik, p. 103): Damit die αἴσθησις eine solche Gruppe als Ganzes erfasst, ist es nöthig, dass ein einzelnes Zeitmoment derselben vor den übrigen durch eine stärkere Intension, einen gewichtvolleren Ictus, hervorgehoben werde. Dieser verleiht ihr denselben Halt, wie dem Worte der Wortaccent, und deshalb redet man auch von einem rhythmischen Accente. On this basis also Gleditsch (Müller's Handbuch, II², p. 688) defines the foot: Die

kleine Gruppe von Grundzeiten welche durch eine σημασία zur Einheit verbunden werden, bildet einen Fuss, πούς, pes. Gleditsch's expression in the preceding paragraph, "stärker hervorgehoben," is indeed capable of being understood in a figurative sense; but I think no injustice is done in attributing to him the usually accepted equation, σημασία, percussio, ictus, = stress, marked by a down-beat.

This view and these terms are of course perfectly applicable in modern English and German verse, though even here they are partial and have greatly misled; but to transfer them to Greek verse is unwarranted and most distorting. There are indeed several ancient definitions of feet that go beyond mere enumeration of the constituent syllables, but stop short of the full statement of the function of feet. These, like the one quoted by Christ, center in the division into arsis and thesis, up-beat and down-beat, 'sublatio' or 'elevatio' and 'positio' or 'depositio,' and assume a regular beating of time by movement of the foot, or sometimes of the hand or finger, which beating of time has for its object the measuring off into the characteristic feet and kola, for speaker or listener or both, of the entire series of times intended. These definitions therefore clearly involve, though they do not explicitly state it, the Aristoxenean view as to the function of the foot. But they say nothing explicitly about good and bad, heavy and light, stressed and unstressed portions. So far Kawczynski and Bennett and Schultz, in the places above referred to (pp. 32 and 53), are right. So much must be granted, whether one goes the rest of the way with them or not. It is impossible to escape the inference that in Greek verse at least, if not also in Latin verse, either there was no regular and constant variation in

stress between arsis and thesis, or such variation was so slight that the Greeks were hardly or not at all conscious of it. In describing their verse the Greeks made nothing of such variation, and gave it no distinct place in their scientific or artistic theory of verse. At the very least, modern writers give to accent in the sense of stress, not only in modern verse but in ancient verse and music, vastly greater prominence than any ancient assigns to it. And even in modern verse and music, unprejudiced examination of the numerous and manifold cases in which rhythm is perfect without any possible variation in stress, and others in which a particular rhythm preserves its essential character under a distinct change of relative stresses, will show that more weight has been assigned to this element than is due. The results of psychological experiments along this line must be received with two deductions. First, as Bennett points out, all the subjects are necessarily persons much accustomed to rhythms of heavy stress and very little accustomed to rhythms in which stress is nearly or quite lacking. What results would be obtained with ancient Greek subjects we cannot know. It is quite possible they might be different. Secondly, starting with the tacit assumption that stress is essential, experimenters have almost confined their investigation to stress-rhythms, unconsciously ignoring other large classes, like the rhythms of motion appealing to the eye alone, or those produced by uniform continuous sound, like a musical note on a pipe organ, interrupted as briefly as possible at regularly varying intervals. These last approach far more nearly to the rhythms of ancient Greek speech, as the ancients describe them, than do any on which psychological experiments have been made, so far as these have come to my notice. In modern music the immense importance of

stress-accent to expression makes it difficult to separate in thought the elements that are intimately united in actual rendering. But such a separation must be insisted on; without it scientific analysis halts half way. And if one will listen to the playing of any simple composition on a pipe-organ without use of the swell, it will become evident that stress is not always essential to rhythm even in our music. The rhythm is unmistakable in such playing, though variation in stress is impossible.

The primary and essential notion which the ancients connected with the terms *σημασία* and ictus, and with the more common terms *θέσις*, *ἄρσις*, *βάσις*, *ὁ κάτω* or *ἄνω χρόνος*, *βαίνεται ὁ ῥυθμός*, and with percutere, percussio, ferire, and the rest, was that of beating time. No extant passage expressly states that the down-beat of hand or foot was accompanied by increased stress in utterance. Whether we, with our relatively great use of variation in stress in speaking modern languages, can properly maintain the rhythm and make it distinct to our hearers of like habit, without a similar, even though slighter, employment of stress in reading ancient verse, is one question; whether the ancients regularly made such a use of stress is another question. And the latter narrows down to these two questions: First, is there any extant passage in which greater stress in thesis is necessarily implied? Secondly, is there from any other source a warrant for assuming slightly greater stress in thesis, even though ancient writers did not recognize it? Of course, also, we must not confuse Greek with Latin usage; the two may have been different in this regard. We have respectable evidence that Latin word-accent included a certain amount of stress, while for classical Greek nothing of the sort has been shown. It is primarily Greek that we are now considering. Without

attempting to review in detail the controversial articles of Bennett and Hendrickson, it will conduce to brevity if we start from the arguments of the latter (A. J. P., 1899, vol. xx, pp. 198–210).

The passage from Aristoxenos (§ 17) *τῶν δὲ ποδῶν οἱ μὲν ἐκ δύο χρόνων σύγκειται, τοῦ τε ἄνω καὶ τοῦ κάτω* (l. c., p. 199) is misinterpreted by Hendrickson; *χρόνος* does not here mean *χρόνος πρῶτος*, as was shown above (p. 134 ff.). Aristoxenos does not admit the existence of the pyrrhic, because the *δίσημον μέγεθος παντελῶς ἂν ἔχοι πυκνὴν τὴν ποδικὴν σημασίαν*. Nothing can be found in these words beyond the simple statement that the alternation of down-beat and up-beat, thesis and arsis, within the *δίσημον μέγεθος* would be altogether too frequent; hence feet of that magnitude are not used. In other words, as a unit of measurement for the whole rhythm such a foot would be too small; for such a rhythm feet of the *τετράσημον μέγεθος* are a far more convenient unit. Exactly the same thing is true of modern music; if very rarely, to produce a special effect, or by way of experiment, a composer has employed $\frac{2}{8}$ time, the exception is of a sort to prove the soundness of the general rule, which excludes $\frac{2}{8}$ time, — not as impossible, but as inconvenient and forced. The same series of times is more naturally grouped in $\frac{4}{8}$ or $\frac{2}{4}$ time, which are therefore universally preferred. This is quite independent of the nature of ictus; and we have seen that our musical rhythms may be perfectly distinct without stress. Complete elimination of stress in rendering a composition of considerable length would make it seem to us tame and expressionless; but the rhythm would still be perfectly clear. Bennett is quite right, then, in refusing to see in this passage of Aristoxenos anything to show that *σημασία* implied stress.

Nor is Hendrickson's treatment of Aristoxenos § 4 any more convincing (l. c., pp. 200 ff.). The interpretation of the passage is discussed at length above (pp. 101–104), where the inadequacy of Westphal's illustration is pointed out. But even if it were admitted that the words of Aristoxenos are to be understood in the restricted sense which Westphal adopted, still it must be borne in mind that such ambiguous combinations always had a context that was not ambiguous. The rhythmic character established by that unambiguous context was without difficulty carried over to and through the portion that would otherwise have been doubtful. This is equally true whether ictus included stress or not. Nothing is better settled by psychological experiments in this field than the fact that the mind tends to imagine a rhythmical grouping where none is objectively present; and the character of the imaginary grouping is easily affected by slight suggestions from accompanying circumstances. Similar ambiguities are frequent in English verse, and they are resolved in the way described. One can easily find, in so perfect a versifier as Tennyson, plenty of lines in which the rhythm at the beginning is made clear only by the closing words of the line. In this case the reader automatically looks ahead, solves the problem, and usually so puts the stress, in accordance with his solution, that a listener perceives no ambiguity. But in many cases it is not difficult to preserve such a balance of stress on the rhythmically doubtful phrase as will practically, for the moment, eliminate stress, and leave the situation substantially what it was in Greek if stress was perfectly level. The listener, then, if he be sensitive to rhythm, feels the momentary ambiguity, but at once resolves it in memory when the succeeding portion makes that possible. The

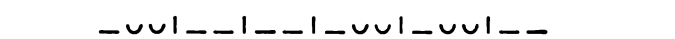
total effect is pleasing rather than otherwise; it is somewhat analogous to the effect in our polyphonic music when the milder discords are resolved into perfect concords. I see no reason, so far as this passage is concerned, why this may not have been the case in Greek rhythm.

And in these cases of a considerable succession of short syllables, as well as in the case of the dipodic grouping of pure trochees or iambi, which Hendrickson next adduces (l. c., p. 202 f.), one principle which Hendrickson overlooks must by no means be left out of view. Exceedingly minute variations in length would be as effective in causing a particular rhythmic grouping as variation in stress. A quantitative difference of a few thousandths of a second would suffice, and would not in the least interfere with the sense that the adjacent short syllables were substantially equal, and that the ratios appropriate to the particular rhythms were preserved with satisfactory precision. And in the ordinary iambic trimeter and trochaic tetrameter there was in fact a marked quantitative difference of that sort, in that the alternate foot might be irrational, and was irrational in a large fraction of the cases. Since the common type was a dipody of one pure and one irrational trochee or iambus, and this dipody in all recitative and in much of the melic verse of this class was constantly recurring, the ancient reader or listener could not but form unconsciously the habit of expecting it. The dipodic grouping, thus marked, was mentally associated with all iambic and trochaic verse; dipodies, and even whole lines, in which the irrational syllable did not occur would yet be grouped unconsciously in the same way; and it is by no means improbable that in rendering such dipodies and lines a faint suggestion of the irrationality, in other words a

minute variation in length, was made or imagined. So far as I can now analyze the process in my own mind — the process was practically complete before this question presented itself to me — the above is a true account of it. That "there is but one principle by which such grouping can take place, and that is intensity on the one or the other of the elements of the group," must be emphatically denied. In short, of positive evidence for increased stress in thesis in Greek verse there is none, so far as I can see, that will bear critical examination.

As regards Latin the situation appears to me somewhat different. Not that the positive evidence from the grammarians is really any stronger; for nothing adduced by Hendrickson appears to me fully convincing by itself. All the writers on metric were so strongly under the influence of the Greek theory that we cannot expect to find in them any view that was not found in their originals or models, anything due wholly to first-hand observation of Latin speech. But if the word-accent, though mainly a pitch-accent, contained also a distinct stress-element, then the Romans were accustomed in daily speech to regular variation in stress, to slightly increased stress on certain fixed syllables. This variation in stress was certainly not so great as to prevent, or render unnatural, the adoption of the quantitative principle as the basis of versification among the cultivated classes, powerfully influenced as they were by Greek letters. Compared with English, the Latin stress was fairly to be called level; every syllable was clearly enunciated; the rhythmizing impulse could apparently have dealt with the language pretty satisfactorily on either basis, so nearly were the stress-principle and the quantitative principle balanced, in the period when the pre-

dominance of Greek culture turned the scale. But the adoption of either principle left the other still in the language, a positive factor in pronunciation of verse as well as prose. In English, German, and Italian the word-accent, strongly stressed in the first two, less strongly in the last, is the more prominent in versification; but quantity, which is simply time of pronunciation, is not thereby eliminated from the verse, and cannot be wholly disregarded by the poet or his reader, though it is in general subordinated. To say, as Bennett does (A. J. P., vol. XX, p. 413), that Latin verse could not be both quantitative and accentual, that a line could not be felt simultaneously as



and as

is clearly erroneous. Finding no difficulty myself in so rendering and feeling it, and in teaching pupils to render it so, I see no difficulty in supposing that a Roman could do the same. Still farther, there is no impossibility or intrinsic improbability, so far as I can see, in the supposition of a rhythm distinctly and primarily quantitative, accompanied by a slight stress on the down-beat, and yet containing a small number of slightly stressed word-accents in arsis, in a certain degree of conflict with the regular ictus. I say conflict, not shrinking from the stronger form of expression; but a better phrase would be, alongside of yet not interfering with the ictus. There are plenty of illustrations of this in English verse; but these can be cited convincingly only with the living voice, for the argument rests wholly on

the manner of rendering.[1] The conflict between the two in Latin was certainly not so sharp as to make Vergil's versification otherwise than pleasing and natural; but in all periods, from Plautus down, the Romans appear to have felt some conflict, if in rhythmically uncertain or less certain combinations the word-accent was too much out of agreement with the rhythmic beats. The precise degree in which that feeling influenced consciously the verse-construction may be and is disputed; that the feeling was there and had some influence appears to be beyond question. In Greek of the classical age there is no trace of such a feeling; the evidence for it in Catullus and Horace, as well as in Plautus, is very strong. In the light of this it is reasonable to give more weight, as regards Latin, to general considerations drawn from modern experiments.

This must be made clearer by examples. In the trimeter of Terence discussed by Cæsius Bassus (p. 555 f. K.; see Hendrickson, l. c., p. 208),

[1] Some examples of what I mean are:

To bend with apples *the moss'd* cottage-trees. (*Keats.*)

But kiss'd it *and then* fled, as Thou *mightest* in dream. (*Shelley.*)

There *is sweet* music here that softer falls
Than petals *from blown* roses on the grass,
Or night-dews *on still* waters *between* walls. (*Tennyson.*)

Our father's kingdom, *because* pure, is safe.

The sweetest harp-*player* in Catana.

Looks once and drives *elsewhere*, and leaves its last employ.

Over *the lit* sea's unquiet way. (*M. Arnold.*)

Of course it is possible to say that these are bad lines. To that one can only reply, Is it likely that the objector is a better judge, in a matter of verse-technic, than poets who were so well-trained and so successful in the practice of the art as those quoted? At any rate, they deemed such combinations of ictus and accent legitimate, and the examples illustrate my point.

Exclusit, revocat, redeam? non, si me obsecret,

every word-accent coincides with a down-beat. Now the phraseology of Bassus does not of itself, to my mind, necessarily mean more than that beating time keeps one clearly in the iambic movement (the line was not isolated, but stood with other senarii), so that the "long" syllables in arsis were unhesitatingly made irrational and the line was felt to be a senarius and not dactylic. But we cannot suppose that the slightly greater stress which would in prose accompany the word-accent was wholly eliminated when those accents coincided with the down-beat. Rather the indisputable sympathetic influence of one set of muscles upon the other would tend to strengthen the inclination already present; that is, the more forcible down-beat of the foot, with the sound of the blow, would tend to increase the inclination to pronounce with more force the accented syllable that accompanied the blow. And this particular line is merely one very good illustration of a rather common phenomenon, common enough to show the tendency referred to above, to make accent and ictus fall on the same syllable, in places where otherwise the rhythm would not be sufficiently clear. A notable case is furnished by Horace, Carm. III 12, in which no word-accent is allowed to fall elsewhere than on one of the three beats of the ionic foot. Of course, as regards the accented longs, that is inevitable and of no significance; but in the case of the two shorts it is otherwise. And though in the sixteen lines of the poem there are twenty-one instances of an accented short penult or antepenult, in every instance that accented short syllable is the former of the pair which the meter requires, never the latter. It is hard to see any reason why Horace never made that pair consist of the final

short of one word and the accented short of a following iambic word, unless it was a desire to make the word-accent a help rather than a hindrance to the perception of the rhythm, since this was an unusual one in Latin. In the very next ode, for example, also containing sixteen lines, but with only twenty-four pairs of short syllables against forty pairs in III 12, there are three pairs consisting of a short final syllable followed by an accented short initial syllable.[1] In Œd. Tyr. 483–512, or in the Persians 66–116, in substantially the same meter as Horace III 12, there is no trace of such a law as Horace observed. In Œd. Tyr. 483–496, for example, one strophe only, and excluding some cases that one might question, there are thirteen pairs of short syllables in which the former is unaccented and the latter accented.

The conclusion is at present for me unavoidable that in Latin the thesis was usually accompanied by a slight stress, which fell, if the thesis consisted of two short syllables, on the former of the pair. The stress was not so strong but that writers on metric could easily overlook it or treat it as of no importance, since rhythm is wholly a matter of time, and stress is merely one means, to them of minor value, though to us the most important, of indicating the grouping of times. In some combinations the stress was not felt at all; even in English it is not always present on every foot, as may be readily discerned by a careful and unprejudiced reader. In plain and well-known meters the Latin poet could allow a good many word-accents, very slightly stressed, to fall elsewhere than in thesis, without disturbing the strong

[1] Catullus 63 furnishes a more complicated and very interesting illustration of the tendency, as I hope to show in a paper to be published not long hence.

quantitative flow; but in more complex or less familiar combinations he felt obliged to shun such disagreements, or admit them cautiously.

It is true that if we had no other evidence for stress in the word-accent, this would be reasoning in a circle; but since comparative philology brings excellent testimony for that from quite another field,[1] the above conclusion really rests on three independent pieces of evidence, no one of them sufficient alone, but all harmonizing and supporting one another, and forming together a strong argument. In regard to Greek verse I can find only one of these three pieces of evidence for stress, namely, that sympathetic influence of one set of muscles upon another. This is derived from modern observation and experiment, and is not convincing alone. We must beware of pressing this too far upon a people who were certainly far more accustomed than we are to rhythms in which stress was weak or lacking.

As to our own practice in reading Latin and Greek verse, we may safely go as far toward eliminating stress as we can without destroying either our consciousness of the rhythm or our hearer's perception of it. If one can, while preserving the rhythm and duly bringing out the poet's thought, at the same time indicate without confusion to the listener those word-accents that do not coincide with a beat, that is an accomplishment not to be underrated, well worth some effort to acquire. But it is not worth any sacrifice of rhythm or thought. For most people the effort to indicate those non-coincident word-accents obscures what is more important. That the Greeks and Romans read so as to preserve clearly all three elements is not questioned, but that is another

[1] See Lindsay, The Latin Language, p. 148 f.; Stolz, Lat. Gram., p. 98 f.

matter. And it should be noted that for us to disregard the word-accents in order to preserve the rhythm is no more than the Greeks, at least, habitually did in singing. The testimony of Dionysios Hal. and his example from the Orestes (De Comp. Verb. 11, pp. 180 ff. Schæfer) are so explicit and detailed as to leave no possible doubt on that point. The rhythm the ancients never disregarded; evidently they deemed it more fundamentally important in poetic form than the pitch accent. If therefore in reading we must choose, we are justified in choosing on the same principle. And if, in order to preserve the rhythm, it is necessary for one to give some stress on the ictus, we being so unaccustomed to maintain rhythm without that, the violence done is next to nothing — by no means equal to the harm done by a course which makes the verse appear to us unrhythmical or scarcely rhythmical. In English and German our practice in singing is analogous to that of the ancients, but precisely reversed. We are not at all disturbed when the composer requires us to neglect the spoken quantities and substitute a new musical rhythm for them; but we expect him to preserve pretty carefully in that substituted rhythm the original (stressed) word-accents.

There remains the serious question of "cyclic" or "three-timed" anapæsts and dactyls, to which so large a place has been assigned. The slightness of ancient evidence for them is well known. It consists of two passages from Dionysios Hal. In the treatise De Comp. Verb. 17, enumerating the various feet, he says:

Ὁ δὲ ἀπὸ τῆς μακρᾶς ἀρχόμενος, λήγων δὲ ἐς τὰς βραχείας, δάκτυλος μὲν καλεῖται, πάνυ δέ ἐστι σεμνὸς, καὶ εἰς κάλλος ἁρμονίας ἀξιολογώτατος, καὶ τό γε ἡρωϊκὸν μέτρον ἀπὸ τούτου κοσμεῖται ὡς ἐπὶ τὸ πολύ. παράδειγμα δὲ αὐτοῦ τόδε·

Ἰλιόθεν με φέρων ἄνεμος Κικόνεσσι πέλασσεν.

οἱ μέντοι ῥυθμικοὶ τούτου τοῦ ποδὸς τὴν μακρὰν βραχυτέραν εἶναί φασι τῆς τελείας· οὐκ ἔχοντες δὲ εἰπεῖν πόσῳ, καλοῦσιν αὐτὴν ἄλογον. ἕτερον δὲ ἀντίστροφόν τινα τούτῳ ῥυθμὸν, ὃς ἀπὸ τῶν βραχειῶν ἀρξάμενος ἐπὶ τὴν ἄλογον ταύτην τελευτᾷ, χωρίσαντες ἀπὸ τῶν ἀναπαίστων, κύκλον καλοῦσι, παράδειγμα αὐτοῦ φέροντες τοιόνδε·

κέχυται πόλις ὑψίπυλος κατὰ γᾶν.

περὶ ὧν ἂν ἕτερος εἴη λόγος. πλὴν ἀμφότεροί γε τῶν πάνυ καλῶν οἱ ῥυθμοί.

A little later (20) Dionysios quotes and comments on some especially appropriate and expressive examples of *σύνθεσις ὀνομάτων*, among them the Sisyphos passage from Od. 11. On the last line of this,

αὖτις ἔπειτα πέδονδε κυλίνδετο λᾶας ἀναιδής,

he says:

Οὐχὶ συγκατακεκύλισται τῷ βάρει τῆς πέτρας ἡ τῶν ὀνομάτων σύνθεσις, μᾶλλον δὲ ἔφθακε τὴν τοῦ λίθου φορὰν τὸ τῆς ἀπαγγελίας τάχος; ἔμοιγε δοκεῖ. καὶ τίς ἐνταῦθα πάλιν αἰτία; καὶ γὰρ ταύτην ἄξιον ἰδεῖν· ὁ τὴν καταφορὰν δηλῶν τοῦ πέτρου στίχος, μονοσύλλαβον μὲν οὐδεμίαν, δισυλλάβους δὲ δύο μόνας ἔχων λέξεις. τοῦτο οὐκ ἐᾷ πρῶτον διεστηκέναι τοὺς χρόνους, ἀλλ' ἐπιταχύνει. ἔπειθ' ἑπτακαίδεκα συλλαβῶν οὐσῶν ἐν τῷ στίχῳ, δέκα μέν εἰσι βραχεῖαι συλλαβαὶ, ἑπτὰ δὲ μόναι μακραὶ, καὶ οὐδ' αὐταὶ τέλειοι. ἀνάγκη οὖν κατεσπάσθαι καὶ συστέλλεσθαι τὴν φράσιν, τῇ βραχύτητι τῶν συλλαβῶν ἐφελκομένην. ἔτι πρὸς τούτοις οὐδὲ ὄνομα ἀπὸ ὀνόματος ἀξιόλογον εἴληφε διάστασιν· οὔτε γὰρ φωνήεντι φωνῆεν, οὔτε ἡμιφώνῳ ἡμίφωνον ἢ ἄφωνον, ἃ τραχύνειν πέφυκε καὶ διιστάνειν τὰς ἁρμονίας, οὐδέν ἐστι παρακείμενον. οὐ δὴ διάστασις αἰσθητὴ, μὴ διηρτημένων τῶν λέξεων, ἀλλὰ συνολισθαίνουσιν

ἀλλήλαις καὶ συγκαταφέρονται, καὶ τρόπον τινὰ μία ἔξ ἁπασῶν γίνεται διὰ τὴν τῶν ἁρμονιῶν ἀκρίβειαν. ὃ δὲ μάλιστα τῶν ἄλλων θαυμάζειν ἄξιον, ῥυθμὸς οὐδεὶς τῶν μακρῶν, οἳ φύσιν ἔχουσι πίπτειν εἰς μέτρον ἡρῷον, οὔτε σπονδεῖος, οὔτε βακχεῖος, ἐγκαταμέμικται τῷ στίχῳ, πλὴν ἐπὶ τῆς τελευτῆς· οἱ δὲ ἄλλοι πάντες εἰσὶ δάκτυλοι, καὶ οὗτοί γε παραδεδιωγμένας ἔχοντες τὰς ἀλόγους, ὥστε μὴ πολὺ διαφέρειν ἐνίους τῶν τροχαίων. οὐδὲν δὴ τὸ ἀντιπρᾶττόν ἐστιν, εὔτροχον καὶ περιφερῆ καὶ καταρρέουσαν εἶναι τὴν φράσιν, ἐκ τοιούτων συγκεκροτημένην ῥυθμῶν.

Though long, these passages should be before the reader without abbreviation, that he may see the full bearing of some expressions that have not been duly regarded. The word κύκλον in the former extract, for which G. Hermann, and before him Upton, conjectured κύκλιον, first suggested and alone supports the name cyclic in this application.

Westphal (Rhythmik, pp. 49–53, and Metrik, pp. 15–26) cites the passages and applies them to the declamation of the rhapsodes. Accordingly he sees in them a strong confirmation of his theory of a radical distinction between verse that was spoken and verse that was sung. The Homeric poems were recited, not sung. Dionysios tells us that in these hexameters from the Odyssey the long syllables are not τέλειοι, but ἄλογοι, shorter than the complete long, some of the dactyls not differing much in duration from trochees. Therefore, it is argued, recitative hexameters in general were less than four-timed. Κύκλιος, cyclic, may well have been an ancient descriptive epithet for these rapid, incommensurable, and variable dactyls. Also, as Dionysios has previously cited Aristoxenos, and cites him alone of the ῥυθμικοί by name, and here attributes this doctrine to the ῥυθμικοί, it seems not unreasonable to suppose that his

authority here also is no other than Aristoxenos. This chain of reasoning is clearly one that merits respectful treatment.

The main grounds for assuming a radical distinction between sung and spoken verse have been examined above (chap. iv) and found fallacious; but what if these passages prove, or assume as settled, a like distinction? Dionysios is himself a good authority; if he really says what is attributed to him, and if besides he is following Aristoxenos, the facts must not be blinked.

However, to take the last point first, there is no proof whatever, at the utmost only a possibility, which may become a probability if the doctrine is found reasonable and not inconsistent with his known teaching, that Aristoxenos is in this case the source. There were certainly other *ῥυθμικοί*; we have seen, for example (p. 12 f.), that the time-scale of consonant, short vowel, long vowel, cited from the *ῥυθμικοί* as a rule of universal application, cannot have been taught in that form by Aristoxenos, because a mind so keen and logical would have seen the patent inconsistency of that scale with the fundamental principles of his rhythmical system as applied to language. And in this case the name Aristoxenos occurs a long way back, in chapter 14, in connection with the description and classification of sounds. The bridge of argument is pretty slender and slippery from so distant a mention of Aristoxenos under the specific title of *ὁ μουσικός*, there employed, to the conclusion that the general term *οἱ ῥυθμικοί* in 17, amid the discussion of another topic, means the same man.

Again in the passage from 17 three points are to be noted. First, the term *κύκλον* is not applied to the dactyl, but to a variety of the anapæst, which Dionysios says these rhythmici separate from strict anapæsts. That

they, or that Dionysios, applied the term to a class of dactyls also is not stated nor in any way implied. While not improbable, it is not proved, nor safely to be inferred from this passage alone. Nor, by the way, do we get elsewhere any hint that Aristoxenos knew of more than one class of either dactyls or anapæsts. Secondly, the anapæsts quoted in illustration can hardly be recitative, if the form *γᾶν* is right. What warrant had Westphal, who accepted that reading, for assuming that these anapæsts were not melic? And Dionysios evidently regarded them as parallel to the dactyls under discussion (*ἀντίστροφόν τινα τούτῳ ῥυθμόν*) in every particular save the order of arsis and thesis. This does not look like a sharp separation between sung and spoken verse. Thirdly, what does *τούτου τοῦ ποδός* in the line following the hexameter refer to? Unless a lacuna be assumed, a rather violent assumption, the phrase must simply resume the *αὐτοῦ* just before the hexameter, the *τούτου* just before that, and the *δάκτυλος* two lines earlier, which immediately follows the phrase of description. Also, the quotation is introduced explicitly as an example of the dactyl, without qualification — the ordinary dactyl, with no hint that there is any other kind of a dactyl. If it is meant as an example of some other than the normal dactyl, why is not that normal four-timed dactyl mentioned separately? Dionysios is here enumerating and briefly describing all the ordinary feet, classified according to the number of syllables, first the disyllabic, then the trisyllabic. Feet of more than three syllables he does not enumerate, expressly saying that he regards them as compounded of these twelve simple feet, *οἱ πρῶτοι καταμετροῦντες ἅπασαν ἔμμετρόν τε καὶ ἄμετρον λέξιν, ἐξ ὧν γίνονται στίχοι τε καὶ κῶλα*. It is true that he is considering prose primarily, but the

expressions just quoted show clearly that he recognizes no essential difference between the feet according as they occur in prose or verse. The difference between prose and verse, rhythmically, results wholly from the way in which individual feet are combined in one and the other. As illustrations therefore of the feet on which prose rhythm depends he gives examples from verse, merely because in them several of a kind occur together. And the closing sentence of the chapter is, *καὶ περὶ μὲν τούτων* [i. e., *ποδῶν*] *οὐκ οἶδ' ὅτι δεῖ πλείω λέγειν*. In other words, he has enumerated and described all the feet of verse, as well as of prose. Where is the full four-timed dactyl? Either it is strangely omitted, or Dionysios supposed it to be in the hexameter quoted.

Again, the *ἄλογος* which the rhythmici saw in these dactyls is unlike the *ἄλογος* of Aristoxenos, so far as that is known from his pretty full and minute description of it examined above (p. 110 ff.), in one particular. His irrational syllable is always in arsis; this of the rhythmici is a thesis. The difference is important and significant. The irrational arsis occurs frequently in iambic and trochaic meters, is found in the *γένος ἡμιόλιον*, apparently also among four-timed feet in some circumstances, but its usage is strictly limited; and when every thesis remains rational, the precise fundamental ratios are never so far hidden or so widely departed from but that the whole is felt to be rhythmical. To extend irrationality to the thesis, however, is a long step towards the unrhythmical. In some way the thesis, whether by stress upon it, or by the fact that it was in some meters always a long syllable, while in the others long syllables were there far less often replaced by shorts than in the arsis, or for some farther reason not yet ascertained —

the thesis was certainly somehow felt to be the more prominent and more fixed portion of the foot. The series of *θέσεις* was in the whole rhythmic design a sort of central thread, a firmer pattern beside and along which are grouped the more varied *ἄρσεις*. It is the latter chiefly that provide the needful relief from monotony, from an arithmetical precision that would be machine-like and repellent. But if in *θέσεις* also there was such a degree of variation from the normal times as can properly be called *ἀλογία*, little of rhythmic ratio is left. Much rather is it probable that less clear-headed followers of Aristoxenos, bringing under his doctrine of *ἀλογία*, where he had not placed it, a phenomenon that we have next to consider, extended his term in a way that he would not have approved. This phase of the doctrine of *ἀλογία* seems to go with that fallacious time-scale which makes any and every consonant equal in time to one half a short vowel. Obviously even in these peculiarly rapid hexameters that scale would not only destroy rhythm, but would prove them to be really rather slow. But the impossibility of practical application of the scale to concrete rhythms, and inconsistency with other plain facts, weighed little with the advocates of the scale over against so pretty an apparent demonstration as they had. So in this case. Seeing in these and like verses a real difference in rapidity of movement when spoken, as compared with other verses in the same class but of more clogging collocation of elements, some rhythmicians, prominent enough to be followed by others, extended the principle of *ἀλογία* to cover the phenomenon.

But the real explanation of the matter Dionysios gives in the second extract. He was a keen critic and rhetorician; repeatedly, after mentioning a view that looks plausible in itself but does not explain the facts quite

satisfactorily, he then leaves the theory in the background and dwells rather on the facts. This he does here. In contrast with the preceding lines, which he has just analyzed and shown to harmonize in phonetic structure with the slow and labored action there portrayed, in this line sounds are combined in a way to favor rapidity of utterance. First, the words are longer — no monosyllable, two disyllables, the rest of three and four syllables. The fewer breaks between words there are, the fewer points of separation. Secondly, of the seventeen syllables ten are short. And of the seven long syllables not one — except the last — contains more elements than are needful to make it pass for long and at the same time avoid hiatus; that is, no long vowel or diphthong is followed by more than one consonant; two consonants occur only where required to extend a short vowel to a long syllable. Again, as between words, there is no hiatus, no semi-vowel or mute meets a semi-vowel, there is no rhetorical pause and no elision, the words almost run together into one. And finally there is no one of the slower feet, — no spondee and no bacchius, for example, except at the end. And even the five dactyls, he adds, do not have the complete long, but "their *ἄλογοι* are so 'chased along' that some of the feet do not differ much from trochees. You see, there is nothing to hinder the line, so constructed rhythmically, from being smooth, swift, flowing."

Clearly, though *ἀλογία* is made a part of this explanation, it is to Dionysios but a small part. The other items are enough without it. It is also clear that Dionysios does not regard even these irrational dactyls as three-timed merely; the nearest approach to that view is in the remark that some are not much longer than trochees. But that implies that even the briefest are somewhat

longer than trochees. Here then, at least, is no ground whatever for the assumption of dactyls in $\frac{6}{8}$ time.

Farther light is thrown on the matter by these well-known passages from Aristides Q.:

(1) Τούτων δη τῶν χρόνων οἱ μὲν ἔρρυθμοι λέγονται, οἱ δὲ ἄρρυθμοι, οἱ δὲ ῥυθμοειδεῖς, ἔρρυθμοι μὲν οἱ ἔν τινι λόγῳ πρὸς ἀλλήλους σωζοντες τάξιν, οἷον διπλασίονι, ἡμιολίῳ καὶ τοῖς τοιουτοις (λόγος γάρ ἐστι δύο μεγεθῶν ὁμοίων ἡ πρὸς ἄλληλα σχέσις), ἄρρυθμοι δὲ οἱ παντελῶς ἄτακτοι καὶ ἀλόγως συνειρόμενοι, ῥυθμοειδεῖς δὲ οἱ μεταξὺ τούτων καὶ πῇ μεν τῆς τάξεως τῶν ἐρρύθμων, πῇ δὲ τῆς ταραχῆς τῶν ἀρρυθμων μετειληφότες. τούτων δὲ οἱ μὲν στρογγύλοι καλοῦνται οἱ μᾶλλον τοῦ δεοντος ἐπιτρέχοντες, οἱ δὲ περίπλεω οἱ πλέον ἢ δεῖ τὴν βραδυτῆτα διὰ συνθέτων φθόγγων ποιούμενοι. ἔτι τῶν χρόνων οἱ μὲν ἁπλοῖ, οἱ δὲ πολλαπλοῖ, οἳ καὶ ποδικοὶ καλοῦνται. (P. 33 f. Mb.)

(2) Ἔτι τῶν ῥυθμῶν οἱ μὲν ταχυτέρας ποιούμενοι τὰς ἀγωγὰς θερμοί τέ εἰσι καὶ δραστήριοι, οἱ δὲ βραδείας καὶ ἀναβεβλημένας ἀνειμένοι τε καὶ ἡσυχαστικοί· ἔτι δὲ οἱ μὲν στρογγύλοι καὶ ἐπίτροχοι σφοδροί τε καὶ συνεστραμμένοι καὶ εἰς τὰς πράξεις παρακλητικοί, οἱ δὲ περίπλεῳ τῶν φθόγγων τὴν σύνθεσιν ἔχοντες ὕπτιοί τέ εἰσι καὶ πλαδαρώτεροι, οἱ δὲ μεσοι κεκραμένοι τε ἐξ ἀμφοῖν καὶ σύμμετροι τὴν κατάστασιν. (P. 99 f. Mb.)

The resemblance between these passages and those from Dionysios has of course been observed, but views have differed as to what conclusions are to be drawn from it. So much depends, in these matters, on the standpoint from which one approaches the question. If we may assume that the whole body of rhythmical doctrine was in all details, or nearly all, settled and harmonious, and terminology likewise, so that slight differences in the latter, as between different writers, point with certainty or high probability to real distinc-

tions of fact, our interpretation in this case will be of one sort. If, however, different writers differed considerably in their terminology, even in some rather important matters, and described the same phenomena not infrequently after different fashions, then our procedure should be of another sort. That the latter supposition is the true one seems to me beyond question. We have therefore in such cases to look always beneath the terminology and examine the phenomena themselves. That requires in this case close attention to phraseology and to sentence-structure, as well as to context.

Passage (1) is part of the very brief division of book I, beginning with chapter 13, that is devoted to rhythm. Chapter 14 begins with the definition of *πρῶτος χρόνος* (discussed above, p. 147 f.); then follow five lines on *σύνθετος χρόνος* — twice, thrice, and four times the magnitude of the *πρῶτος*. Then follows (1). The first words, *τούτων δὴ τῶν χρόνων*, can refer only to the times just described — in brief summary, the various time-intervals that art is concerned with. Of these, some are *ἔρρυθμοι*, others *ἄρρυθμοι*, others *ῥυθμοειδεῖς*. But if some are unrhythmical, it appears that the author, in seeking brevity, has tacitly extended the range of *τούτων τῶν χρόνων* somewhat, and now is taking into account all time-intervals as they present themselves in continuous speech. (Aristides of course has in view also the other rhythmic arts, but we are considering speech, and his language in what follows must have been largely determined by peculiarities of speech as a rhythmizomenon.) In speech, then, some of the times, in their relations to their neighbors, form a perfect rhythm, others a partial, shifting, imperfect rhythm. So far the passage is a single sentence, — a fact to be emphasized, because the sentence is sometimes printed as three, as by Westphal

(Rhythmik, p. 95, and elsewhere), and that changes the aspect of certain points. We now ask what times are meant by the τούτων which begins the next sentence. Are they the ῥυθμοειδεῖς only, or are they the same as the τούτων τῶν χρόνων above? Martianus Capella's 'quorum temporum' does not help at all.

If the reader will divest himself of preconceived opinions and read the entire chapter with fresh attention, the two possibilities will take this form. First: This τούτων merely resumes the τούτων τῶν χρόνων and is again repeated in ἔτι τῶν χρόνων of the last sentence. That is, Aristides first defines the individual χρόνοι employed in rhythmic art — the πρῶτος, or unit, and the varieties of the σύνθετος χρόνος. Then treating these χρόνοι as a body, he mentions, in three sentences, one for each, three ways of classifying them — three classifications quite independent of each other and of that which he assumed in his definitions. Indeed, in the third classification, though it is not clear precisely what he means by ἁπλοῖ and πολλαπλοῖ, it is clear that the ποδικοί do not exclude all ἁπλοῖ; that we have in this sentence, not strictly three classes made on a common basis, but rather a set of three somewhat related epithets applied to χρόνοι to indicate certain different and not altogether mutually exclusive relations. That state of things in the last sentence has a bearing on the other classifications; in particular it explains, by the attitude of mind which it indicates, what was called above tacitly extending the range of τούτων τῶν χρόνων so as to include all χρόνοι of continuous speech. What there seemed a comparatively slight inaccuracy of expression, excusable in so brief a summary, is here seen to be a frank absence of any claim that he is describing mutually exclusive classes. Besides it must not be forgotten that Aristides is merely making

a very brief compilation; we must not expect in any such work, however well done, the logical precision of an Aristoxenos, writing at ten or twenty times as great length on the same topic. Or, secondly: If the τούτων refers to ῥυθμοειδεῖς alone, all else that has just been said still remains true. We should go beyond the intention of Aristides if we insist always on sharp distinctions between the classes to which these epithets apply. And from the essential nature of language rhythm, ἔρρυθμοι, ἄρρυθμοι, ῥυθμοειδεῖς are not and cannot be made mathematically exact terms. That does not lessen their value and utility, if they are not abused. They describe conveniently certain classes of effects that shade imperceptibly into each other. When the ratios between the times of a group are few, and reach a sufficient degree of regularity, the times, or the group, may be called ἔρρυθμος; if the ratios are too numerous and too irregular, the result is ἀρρυθμία; a group intermediate in character is ῥυθμοειδής; on some groups any two people might disagree. No one of these epithets can be applied to a single time-interval, except to indicate its relation to another, or to a group.

Under these circumstances it becomes of minor importance in which of these two ways this second τούτων was intended. In either case the sentence applies to the ῥυθμοειδεῖς, which reach over into the ἔρρυθμοι, and it cannot apply to a group that in a concrete form, as sung or recited on a particular occasion, is ἔρρυθμος with mathematical precision. As to ἄρρυθμοι one hardly raises the question; if one does raise it, I should say the sentence might well enough apply to them. But a given group as sung by one performer might be so perfectly rhythmized that there could be no question of στρογγύλοι or περίπλεφ, while as recited — and well

recited — by another, the listener might hesitate whether to call the same group ἔρρυθμος or ῥυθμοειδής, and find some parts στρογγύλοι and others περίπλεφ. To overlook this state of the facts is to misconceive the essential nature of rhythm in art. It was to put in the proper light such problems as this that so much space in Chapter III was given to the subject of rhythm in language.

Looking now more closely at some details of the sentence, we see that the phrases μᾶλλον τοῦ δέοντος and πλέον ἢ δεῖ imply a standard of rapidity. That can be nothing else than the time — that is proportionate time, or ratios between times — demanded by the mathematically exact rhythmic pattern. Syllables which perceptibly move more rapidly than that are called στρογγύλοι; if more slowly, they are called περίπλεφ. The latter acquire their relative slowness διὰ συνθέτων φθόγγων. Now what else can this mean, in application to verse, than what Dionysios means by τὰς τῶν γραμμάτων συμπλοκάς? (Op. cit. 16, p. 196 Schaefer.) In that chapter he employs a variety of expressions to denote the manifold combinations of sounds that lighten, hasten, delay, make smooth or harsh, variously expressive and fit, the style of verse or prose. Such phrases are παρατιθεὶς ἀλλήλοις τὰ δυσέκφορα (p. 204 Sch.), τὰ δυσεκφορώτατα λήψεται καὶ καταπυκνώσει τούτοις τὰς συλλαβάς (p. 206 Sch.); by such means one produces ἀναβολὰς χρόνων (p. 208 Sch.). And we have seen (above, p. 175) that he analyzes the phonetic structure of the Sisyphos lines on this basis, explaining how and why the description of the sufferer's toil is labored and slow in rhythm, and that of the stone's fall rapid. What reason is there for supposing that the two men, or their authorities, did not have in view the same phenomena, though describing them in slightly different terms?

But the difference in terms is really very slight. Dionysios calls the *φράσιν* of the rapid line *εὔτροχον καὶ περιφερῆ*; *στρογγύλος* means primarily round, spherical; in passage (2) Aristides couples *ἐπίτροχοι* and *στρογγύλοι* as synonyms; *κύκλος* is a circle, *κύκλιος* round. All alike contain the same figure, obtain the meaning rapid through the same group of associations, and are applied to the same kind of feet and of rhythmic movement. I see no ground for assuming a distinction of technical significance. Rossbach once took *στρογγύλος* and *κύκλιος* as equivalents; the reasons given for rejecting that view (e. g., by J. Caesar, Grundzüge d. gr. Rh. p. 98 f.) are not cogent. And *περίπλεως* is merely over-full, that is, containing sounds of such character or number or both as to require for clear enunciation more time than the exact pattern allows. Either they must be unduly compressed to crowd them into the interval allowed by it, or they retard the tempo a little. The former is allowed in singing, as one phase of the fuller *πλάσμα* of song; in the speaking voice the *ritardando* is unavoidable. The relation of this to *ἀλογία* is obvious. It seems to me therefore entirely natural that some of the rhythmici should have extended the class of *ἄλογοι*, as described by Aristoxenos, to include under it either the *στρογγύλοι* (*κύκλοι* or *κύκλιοι*) or the *περίπλεῳ* or both. The phenomena themselves were unmistakable; not having clearly in mind the single broad principle of rhythmization, the basis of all concrete rhythms in art, they could not apply that principle to such phenomena, but sought other technical explanations; and this has led to distinctions and to precise measurements that are illusory

Citation (2) is in harmony with this interpretation of (1). Aristides in this entire chapter is describing the

ethos of different rhythms. Here he characterizes first the differing effects of rapid tempo and of slow tempo, the same tempo continuing throughout; then the effects of *στρογγύλοι καὶ ἐπίτροχοι* passages and of *περίπλεφ* passages within a given rhythm, with whose normal movement these more rapid or slower passages are compared in the mind of listener or spectator. The Sisyphos lines are analyzed by Dionysios as an illustration of both these latter effects. Now returning a moment to the starting-point of our discussion of "cyclic" feet we see that Dionysios was quoting ordinary dactylic and anapæstic lines, which when recited or read with expression moved a little more rapidly or more slowly than the exact $\frac{2}{4}$ time. The most rapid of them he does not conceive as reduced to $\frac{8}{8}$ time; no ancient writer, late or early, offers any basis for a belief in such dactyls or anapæsts. But the terms *στρογγύλος* or *κύκλος* (perhaps *κύκλιος*) and *περίπλεφ* mark real variations from the strict rhythmic pattern, which is nevertheless felt to exist underneath the variation, as the norm to which the movement constantly tends to return. Among these *στρογγύλοι* and *περίπλεφ* are to be found one class, at least, of the *βραχυτέρας βραχύτεραι* and the *μακρᾶς μακρότεραι*. The phenomena are no less marked in modern English verse than in ancient Greek. Analogues in modern dances are frequent, and their *ethos* is in general pretty well described by Aristides. Moreover in verse these variations are more pronounced and more frequent in reading than in song. In this respect the difference between musical and spoken rhythm is really considerable, and goes far to account for many things. For example it is the slight basis of fact for that far too sharp distinction between recitative and melic rhythm which so many have insisted on; it explains indeed why

so many fail to recognize the true character of rhythm in modern verse. The departures from the exact pattern are so great that they obscure this, unless one not merely has a rhythmic sense of at least average delicacy, but has in addition trained his consciousness of rhythm and acquired some skill in detecting the precise ratios of the regular rhythms. To any one so qualified — and most people can, if they care to, so qualify themselves — any verse that can be called good plainly reveals the exact pattern underneath, to which the movement tends to conform, and conforms more fully the more the reader, whether from the child's fondness for distinct rhythm or from the character of the poetry, approaches in his reading to the musical style.

VI

COMPOUND AND MIXED METERS

It is beyond the scope of this volume to set forth in detail a complete system of Greek metric; but some application of the foregoing principles to the explanation of specific meters may fairly be demanded. The so-called dactylo-epitritic and logaœdic meters are so common, and have been so much the subjects of controversy, that no one who writes on metric can ignore the problems they offer, whether he believes himself to have completely solved their riddles or not. We will consider the two briefly in the order named.

Perhaps the best approach to the former is by way of Blass's view, which rests on a portion of the ancient tradition. His view was first published in Fleckeisen's Jahrb. for 1886 (pp. 455 ff.), and is repeated in the preface to his Bacchylides (pp. xxix ff.). I will first summarize his argument, urging the reader to test my summary by turning to Blass's own pages in one volume or the other.

The name dactylo-epitritic is not ancient, but modern, as also the current description of this meter. In the scholia to Pindar verses of this sort are called *δίμετρα* (*τρίμετρα*) *προσοδιακά*, and according to Blass it is the invariable teaching of the ancients (constans veterum doctrina) that the feet are not dactyls or anapæsts, but choriambs and ionics: the dimeter of the scholia is $- \cup \cup - \mid \cup \cup - -$, choriambus and ionic a minore. Indications of this view are to be found even in Aris-

tophanes and Plato. In the Clouds, Sokrates, who professes amongst other arts that of rhythm, *τὴν περὶ ῥυθμῶν*, is asked by Strepsiades, what is the use of a knowledge of rhythm, and replies,

> *πρῶτον μὲν εἶναι κομψὸν ἐν συνουσίᾳ*
> *ἐπαΐοντ' ὁποῖός ἐστι τῶν ῥυθμῶν*
> *κατὰ δάκτυλον χὠποῖος αὖ κατ' ἐνόπλιον.*

These two classes of rhythms were therefore both well marked and similar. There is also a scholion of Hephaistion in which the likeness is put in a clear light: *κατ' ἐνόπλιον μὲν οὖν* (sc. *ἔπος*) *ἐστι τὸ ἔχον δύο δακτύλους καὶ ἕνα σπονδεῖον, οἷον*

> *ὣς φάτο δακρυχέων τοῦ δ' ἔκλυε πότνια μήτηρ.*

That is, there are certain hexameters (e. g., the first of the Iliad) which take the form of the *ἐνόπλιος*, in that they have a spondee in the third and sixth places, and there alone. These are exactly like Pindar's Nem. IX 1, *Κωμάσομεν παρ' Ἀπόλλωνος Σικυωνόθε, μοῖσαι.* These, therefore, are true *ἐνόπλιοι*, and this class of meters is familiar to us as to the contemporaries of Aristophanes. Farther, Plato, Rep. 400 b, speaking of meters of the *γένος ἴσον*, quotes Damon as naming *ἐνόπλιόν τινα ξύνθετον καὶ δάκτυλον καὶ ἡρῷόν γε.* Here we have three forms in place of two; the *ἡρῷος* is now distinguished from the simple dactylic. Again, Marius Vict. explains the difference between these as follows: Differt a dactylo heroum eo, quod et dactylicum [et spondiacum] est, et in duas caeditur partes, . . . dactylicum enim, licet isdem subsistat pedibus, non tamen isdem divisionibus ut herous caeditur versus. That is, Blass proceeds — but I must remark that what follows is not in Marius Vict. nor in any other ancient —

but Blass proceeds, if you divide Il. A 1 not by tripodies, *μῆνιν ἄειδε θεὰ Πη | ληιάδεω 'Αχιλῆος*, but into three dipodies, *μῆνιν ἄειδε θε | ὰ Πηληιά | δεω 'Αχιλῆος*, you will have dactylic verse instead of heroic, except indeed that the spondee in the third foot is less suited to the dactylic. This, Blass tells us, is the meter *κατὰ δάκτυλον* that Aristophanes refers to. But in what particular does the *ἐνόπλιος* differ from the heroic? The term used by Plato in *ἐνόπλιον ξύνθετον*, which Blass affirms (but on no ground that I can discover) cannot signify anything composed of equal parts, but must signify something composed of diverse parts. If therefore you divide *μῆνιν ἄει | δε θεὰ Πη* | you will have the *ἐνόπλιος ξύνθετος*, which consists of two parts that are equal in extent, for they have each six times, but are very different in form. But we have seen, Blass adds, that this is the division given by the metrici (i. e., the metrical scholia) to the *προσοδιακός*. Blass takes *προσοδιακός* to be the Aristoxenean name; but as one is enough, he prefers the name *ἐνόπλιος*, testified to by Aristophanes and Plato. Baccheios also gives a similar division for the meter which he calls *ἐνόπλιος*, *ὁ τὸν πίτυος στέφανον*, this consists, he says of iambus, pyrrhic, trochee, iambus ⏑ – | ⏑ ⏑ | – ⏑ | ⏑ –|. Marius Vict. also says of the kolon – ⏑ ⏑ – ⏑ ⏑ – –, appellatur quadrupes *δυωδεκάσημος περίοδος*, eo quod quattuor pedes temporum duodecim quasi per circuitum quendam recurrentes contineat. The feet are – ⏑ | ⏑ – | ⏑ ⏑ | – ⏑ |[1]. It is clear that these are not doctrines of the vulgar metrici, but of the musici, since this word *περίοδος* belonged to the musici, in the sense of a round of three or four unlike feet, as of three trochees and an iambus. In this sense Aristides employs it, as well as the Pindaric

[1] Marius Vict. in Keil's text puts a spondee in the last place.

scholia, and also — according to Blass, but in my judgment he is mistaken — the Oxyrhynchos fragment of Aristoxenos. Whether now you so divide as to make four disyllabic feet, or two feet of four syllables each, there will always remain that unlikeness of parts that Plato's term *ξύνθετος* demands. It makes no difference whether the series begins with arsis or thesis — or rather makes only a difference of form, not of real character or name. Thus we find the various forms of the enhoplius expressed by the formula (⏑) – ⏑ ⏑ – ⏑ ⏑ – (⏑). The syllable which may be prefixed to the first apparent dactyl is generally long, but may be short; so of the syllable that may follow the last apparent anapæst. Finally, in place of choriambus or ionic may stand the trochaic or iambic dipody, commonly with one arsis prolonged. Thus the scholion to Ol. III v. 2 of str. calls the line *προσοδιακὸν τρίμετρον*; then on the next line, *ὕμνον ὀρθώσαις, ἀκαμαντοπόδων*, the description given is *προσοδιακὸν τρίμετρον καταληκτικὸν ἀπὸ τροχαϊκῆς συζυγίας ἀντὶ τοῦ ἀπ' ἐλάσσονος ἰωνικοῦ*. This description is obviously correct; for if you take the form – ⏑ ⏑ – ⏑ ⏑ – – and prolong the third and fifth syllables, you obtain – ⏑ – – – ⏑ – –; if you take the other form – – ⏑ ⏑ – ⏑ ⏑ – and prolong the fourth and sixth, the result will be – – ⏑ – – – ⏑ –, etc.

At this point one cannot but ask, Why select precisely the third and fifth, or the fourth and sixth, out of the eight? By that method any meter can be made to produce any other you like; it is indeed the very process by which certain grammarians (e. g., Terentianus Maurus, 1861 ff.) constructed stemmata of meters in complete independence of all historical basis. By prolonging the second and fifth of the first form you get bacchiic; by shortening the fourth and seventh you get paionic; and

so on. But this lengthening and shortening of syllables means changing ratios and passing from one class of rhythms to another. This theory of enhoplii has in fact won adherents partly because it seemed to explain a great variety of metrical forms. It does so because it postulates a common measure that is so protean. Almost any combination of four syllables is a foot, according to this theory. Let us go back and examine our steps, to see where they led us astray.

First we will take a look at the Aristophanes passage. What is Aristophanes doing in that scene? He is showing how silly and worthless is the teaching of the sophists. To be able to distinguish what rhythm is *κατὰ δάκτυλον* and what is *κατ' ἐνόπλιον* may make one *κομφὸν ἐν συνουσίᾳ*; it has no other value. Could the comedian say more plainly that, in his judgment, for the average man at least, distinguishing between rhythms *κατ' ἐνόπλιον* and *κατὰ δάκτυλον* was hair-splitting? The *ἀλεκτρυών* joke follows immediately. Plainly, the poet thinks it no more worth while to distinguish rhythms *κατ' ἐνόπλιον* and *κατὰ δάκτυλον* than to violate Greek usage by distinguishing the *ἀλεκτρυών* into *ἀλέκτωρ* and *ἀλεκτρύαινα*. The distinction could be made, but seemed funny. The two rhythms were to Aristophanes as much alike as cock and hen, for which the ordinary Athenian thought one word sufficient, — as we, in ordinary speech, have no need to distinguish fish into masculine and feminine.

The scholion to Hephaistion tells us the same in another form. The dactylic line, *ὣς φάτο δακρυχέων τοῦ δ' ἔκλυε πότνια μήτηρ*, and plenty of others, contain twice each the member – ∪ ∪ – ∪ ∪ – –; such a hexameter the scholiast says is *κατ' ἐνόπλιον*. The line does not therefore cease to be a dactylic hexameter. It is

merely the first of seven varieties of hexameter to which that scholion (p. 167 W.) gives separate names. Nor does this scholiast divide the line in any other than our ordinary way. He describes it as *ἔχον δύο δακτύλους καὶ ἕνα σπονδεῖον*. If these be *ἐνόπλιοι*, there is no mystery about them.

Now in the Plato passage what have we? Says Socrates, "I think I have heard him name a certain *ἐνόπλιος*, a compound, and a dactyl, yes, and a *ἡρῷος*." I do not see the slightest reason for supposing that Plato, by the epithet *ξύνθετος*, intended to imply anything more than the scholion in Hephaistion where he describes the *κατ' ἐνόπλιον ἔπος* as having two dactyls and a spondee. Aristoxenos would have called the half-line a *ποὺς ξύνθετος*; to him a *ποὺς ξύνθετος* was made up of like parts, not of unlike. For example, in giving the *ποδικαὶ διαφοραί* he says (p. 298 Mor.): *οἱ δὲ ἀσύνθεται τῶν συνθέτων διαφέρουσι τῷ μὴ διαιρεῖσθαι εἰς πόδας, τῶν συνθέτων διαιρουμένων*. What evidence have we that Plato meant anything else?

The remarks of Marius Vict. (p. 70 ff. K.) call for a somewhat longer examination. More fully than as quoted by Blass they run as follows: "The principal form of dactylic verse is that which is called the heroic line. This differs from the dactylic in this, that the heroic line is both dactylic and spondaic, and is divided into the two parts mentioned above, the penthemimeres and the hephthemimeres. For the dactylic, though it consists of the same feet, is on the other hand not divided in the same way as the heroic line." This clearly refers to the fact that the dactylic verse of lyric poetry appears most commonly in kola of three or four entire feet, namely two dactyls and a spondee or three dactyls and a spondee; often also in tripodies or tetrapo-

dies of pure dactyls. Combinations of such kola produce a rhythmical effect and had a musical character different from that of the heroic verse, with its pause commonly within, instead of just after, the third foot. For example, from the parodos of Œd. T.:

ὦ Διὸς ἀδυεπὴς φάτι, τίς ποτε τᾶς πολυχρύσου,

and

εἴ ποτε καὶ προτέρας ἄτας ὕπερ ὀρνυμένας πόλει
ἠνύσατ' ἐκτοπίαν φλόγα πήματος, ἔλθετε καὶ νῦν.

Here are three dactylic hexameters; but they are in effect, taken together, very different from heroic hexameters. Much more do dactylic verses of three and four feet, though still made up of the same feet as the heroic verse, differ from it in effect.[1] Familiar examples are Soph. El. 130–134, or Alkman's

Μῶσ' ἄγε, Καλλιόπα, θύγατερ Διός,
ἄρχ' ἐρατῶν ἐπέων, ἐπὶ δ' ἵμερον
ὕμνῳ καὶ χαρίεντα τίθει χορόν.

A little farther on (p. 73 K.) Marius Vict. adds: "This also let me not pass over, as it is worth the notice of an educated ear, — a fact observable in the dactylic hexameter, which will still consist of two dactyls and a spondee in each of the two kola. In such a line are found the four disyllabic feet, i. e., trochee, iambus, pyrrhic, spondee, always placed in that order — if you choose to scan it in another way than the law of the heroic hexameter requires. Such is the Homeric line,

[1] So Rossbach, Metrik[3] p. 91, note 1. Compare also Terentianus Maurus, 1630 f.:

sed non et sextum [locum] pes hic sibi vindicat umquam,
nisi quando rhythmum, non metrum, componimus.

"But this foot (the dactyl) never claims the sixth place too, except when we are writing *lyric* instead of recitative verse."

Ζεὺς δὲ θεῶν ἀγορὴν ποιήσατο τερπικέραυνος,

or in Vergil,

Incipe Maenalios mecum, mea tibia, versus.

And this is called quadrupes δυωδεκάσημος περίοδος, because it contains four feet of twelve times recurring as in a sort of regular round."

The points to observe here are these. First, our grammarian is here dealing with genuine and ordinary dactylic hexameters. He is careful to indicate that they remain so (cui tamen duo cola e duobus dactylis et spondeo constabunt), in spite of this curious fact about the four dissyllabic feet discoverable therein. Secondly, he gives this expressly as a mere curiosity, of some interest to a student, but not bearing on the real character of the line as a rhythmical form. He takes pains to say that the law of the heroic hexameter calls for a different division, which that mode of scanning would contravene (si velis alias quam hexametri heroi lex postulat scandere).

And thirdly, how about the term περίοδος in this sense, and the use of it by musici and metrici? It is true that Aristides Q. employs the term in this sense, that the title of his work is περὶ μουσικῆς, and that in his sections on rhythmic he follows in part the doctrine of the older musici. On the other hand, he is in his metrical teaching distinctly a metricus.[1] In other words he is an eclectic, of late date, and every statement of his that differs, or appears to differ, from what we know to be a doctrine of Aristoxenos must be carefully exam-

[1] "Seine Behandlung der eigentlichen Metrik nimmt auf die Rhythmik keine Rücksicht, ist vielmehr, wenn auch nicht in Widerspruch damit, doch in der Aufstellung der Gesetze davon unabhängig." J. Caesar, Grundzüge d. Metrik, p. 32.

ined, before we can be quite sure to which school it belongs. The fact that he employs periodos in this sense does not of itself prove that it was so employed by Aristoxenos, or by any real musicus. We must look elsewhere for evidence.

At least two meanings of περίοδος were current, and our later sources contain, in several versions, definitions of the two side by side, as if the compiler were unaware that they were two.[1] For example, Marius Vict. earlier in his treatise (p. 55 K.) says:

Nam periodus, quae latina interpretatione circuitus vel ambitus vocatur, id est compositio pedum trium vel quattuor vel complurium similium atque absimilium, ad id rediens unde exordium sumpsit, sicut temporis lustrum vel sacrorum trieteris, dicitur in poematis, quando non versus omnes eodem metri genere panguntur, sed ex variis versibus carmen omne compositum per circuitum quendam ad ordinem suum decurrit. περίοδος dicitur omne hexametri versus modum excedens, unde ea quae modum et mensuram habent metra dicta sunt. subsistet autem ex commatis colis et versibus.

Plainly the first clauses here describe the kind of periodus mentioned in the other passage, cited by Blass. This periodus consists of a few feet, which may be quite dissimilar, forming a sort of round; apparently the more unlike the feet, the more interesting the periodus was. This round when finished was at once repeated, as the combination – ∪ | ∪ – | ∪ ∪ | – – | in the hexameter designated as κατ' ἐνόπλιον. But the last two sentences describe a very different thing. This περίοδος is longer

[1] For this whole discussion of περίοδος, cf. Westphal-Gleditsch, Allg. Theorie d. gr. Metrik, pp. 177–89, especially the last two pages. Also Christ, Metrik, pp. 86–88. The latter's explanation of the probable origin of the later usage, by Aristides Q. and others, appears reasonable.

than a hexameter, and contains two or more kola, kommata, or verses. One might fancy for a moment that the author intended to differentiate the two senses by using the Latin form for one and the Greek form for the other; but the other passage, to judge from our MSS., forbids that.

Again in Schol. A. to Hephaistion *περὶ ποιήματος* (p. 218 W.) we find:

Περίοδός ἐστι ποδικὴ ἐν τρισὶ ποσὶ καταρίθμησις· ὥσπερ γὰρ τὸ μὲν δακτυλικὸν ὑπὸ ποδὸς μετρεῖται, τὰ δὲ ὑπὸ συζυγίας, τουτέστι δύο ποδῶν ἁπλῶν, οὕτω καὶ ὑπὸ περιόδου, τουτέστι τριῶν ποδῶν, ὡς ἐν συζυγίᾳ καταμετρεῖται ἄνευ ἀριθμοῦ τινὸς ὡρισμένου, οὐκ ἐπιφερομένης τινὸς ἀντιστρόφου, ἀλλ' ὥσπερ ἀδιαφόρως, εἰ τύχοι, τριμέτρων (ὄντων) δύο καὶ ἑνὸς τετραμέτρου καὶ μονομέτρου καὶ ἑξῆς ὁμοίως, ἀδιαφόρως οὔσης τῆς αὐτοῦ ποσότητος. Περίοδος γὰρ ἡ ἐκ διαφόρων κώλων περικοπή, ὡς ἐν τῷ παρ' Ἀλκαίῳ ᾄσματι· ἀνταπόδοσις γὰρ γίνεται συστηματική.

Though the middle third of this is unintelligible and probably mutilated, it is clear that we have here also the same two kinds of *περίοδοι*, in the same order, with no hint that the compiler saw that they were different. One consists of a few feet, which constitutes a group that is treated as a unit of measurement, parallel in its function to the single foot and the dipody. The other is a section consisting of several kola. The scholion immediately before this has no allusion to the latter, but clearly describes the former in the words: *Περίοδος δέ ἐστιν ἡ ἐκ διαφόρων ποδῶν ἐν τῷ στίχῳ σύνθεσις, οἷον δακτύλου τροχαίου ἀναπαίστου ἰάμβου καὶ εἴ τι τοιοῦτον· ἀκολούθων μέντοι ὄντων καὶ τῶν ἑξῆς, οἷον καὶ τὸ προσοδιακόν ἐστιν.* The sentences of Hephaistion to which these scholia refer emphasize the function of this *περίοδος* as a unit of measurement.

But this briefer *περίοδος*, as far as I can recall, appears only in our later authorities, from the time when the metrici, speaking broadly, held the whole field. The other kind, consisting of two or more kola, appears unmistakably in earlier writers, and in these without a rival. Dionysios, in the treatise already cited so often (19, pp. 260, 262 Sch.), speaks of *τὰ κῶλα, ἐξ ὧν ἑκάστη συνέστηκε περίοδος*, and tells us that the older melic poets, as Alkaios and Sappho, made their strophes small, while Stesichoros and Pindar, *μείζους ἐργασάμενοι τὰς περιόδους, εἰς πολλὰ μέτρα καὶ κῶλα διένειμαν αὐτάς, οὐκ ἄλλου τινὸς ἢ τῆς μεταβολῆς ἕρωτι.* This has the air of being derived from excellent early tradition. The argument of Westphal (Metrik, p. 187 f.) is persuasive. Suidas tells us that Thrasymachos of Chalkedon *πρῶτος περίοδον καὶ κῶλον κατέδειξε καὶ τὸν νῦν ῥητορικῆς τρόπον εἰσηγήσατο.* These technical terms were certainly not invented by him; he introduced them into the theory of rhetoric, the younger, from the older and already well developed terminology of music. Though *περίοδος* does not occur in our fragments of Aristoxenos, it is highly probable that he used it in this sense and in this only. He had no use for it in the other sense; any group of times employed as a measure was to him a *πούς*, simple or compound. The passage from the Oxyrhynchos fragment runs as follows:

Τὸ *γὰρ μονόχρονον οἰκειότερον τοῦ τροχαϊκοῦ ἢ τοῦ ἰάμβου· οἷον ἐν τῷ*

βᾶτε βᾶτε κεῖθεν, αἱ δ' εἰς τὸ πρόσθεν ὀρόμεναι·
τίς ποθ' ἁ νεᾶνις; ὡς εὐπρεπής νιν ἀμφέπει,

τρεῖς πόδας διαλείπουσιν αἱ ξυνζυγίαι, ὥστε περιοδῶδές τι γίγνεσθαι.

This can surely not be cited as evidence that Aristox-

enos used περίοδος in the sense desired by Blass. First there is no proof, but only a certain degree of probability, that these fragments are from Aristoxenos. They may be from one of those ῥυθμικοί who followed him in many respects, but introduced developments inconsistent with his fundamental doctrines. In the mutilated state of the papyrus some parts are not yet intelligible; but not a little of it seems to harmonize very ill with what we already had of Aristoxenos. Secondly, the other sense of περίοδος applies here perfectly. Rhythmically the verses are identical with Aisch. Eum. 516–519,

> ταῦτά τις τάχ' ἂν πατὴρ ἢ τεκοῦσα νεοπαθὴς
> οἶκτον οἰκτίσαιτ', ἐπειδὴ πίτνει δόμος δίκας.

No one would hesitate to call the latter a περίοδος, as do Rossbach and J. H. Schmidt. And the papyrus gives the reason. The triseme — ξυνζυγία denoting the union of the two usual χρόνοι ποδικοί into one, a μονόχρονον — recurs in the place of every fourth foot, marking the end of each kolon; the repetition of these kola to the number of four — or of three as in Eum. 332 ff., or six as in Eum. 998 ff., but most plainly of all with four — inevitably, if a distinct close or obvious rhythmical change then marks the end of the series, produces the impression of a larger unit including them all. And that is the essence of the περίοδος in the older meaning, which is still the usual one among writers on metric.

The positive grounds advanced by Blass for believing his theory of so-called dactylo-epitritic verse to be the one current in the classical age have now been critically examined and found insufficient. The scholia to Pindar generally follow it; the Bacchylides papyrus may show the influence of an editor who followed it, though that is far from certain; Hephaistion and his scholiast

recognize it; but to claim it as the 'constans veterum doctrina' is to build a structure far too large for its base. Even the scholia to Pindar frequently describe lines on the other system, as O. Schroeder in his new edition of Bergk's Pindar is forced to admit (App. p. 498). Schroeder offers no explanation of their inconsistency, and attributes no value to such scholia as do not make for his view. He cites, however, *δακτυλικὸν τρίμετρον* O. VI ep. 6[a], *δακτυλικὸν πενθημιμερές* passim, and others.[1] But we must go farther, and see whether the theory is not inconsistent with fundamental and well-established principles taught by Aristoxenos.

If we look at such a division of the heroic hexameter of the *κατ' ἐνόπλιον* form, what do we find? Does that division correspond to any rhythmical fact? Take again either of the hexameters used by Marius Victorinus. The scheme is $- \cup \cup - \cup \cup - -$ repeated. Let us hold our attention to realities, with as little attention as possible to theories. To call the line rhythmical means that it exhibits, when spoken, a regular arrangement of times, temporum inter se ordo quidam. We wish to ascertain and state what that arrangement of times is in this case. This arrangement of times, observe, is a matter of spoken sounds purely. What arrangement of times appears in fact in that series of spoken sounds? Now, when one raises clearly that question about any series of sounds, he is at once forced to raise the farther question, How can we make clear to ourselves and describe to others the arrangement of times that we hear? It was by way

[1] Though inclined to ridicule the "recentiores" who assume tetrasemes at the end of dactylic kola (p. 498), Schroeder is obliged himself to insert tetrasemes pretty freely (p. 503 ff.) to produce the desired ionics and choriambs from combinations that on their face have nothing to distinguish them from plain dactyls.

of answering this last question that Aristoxenos defined the foot in the manner already discussed. We must find within the series of times a smaller group of times, such that by its repetition, perhaps with slight variations that do not destroy our sense of the substantial identity of the group, it measures off the whole and makes the rhythmical character of the whole intelligible. That smaller group is a foot; and nothing else is a foot in the strict sense, that is, in actual function, though we properly apply the general term and give a specific name to any group that is potentially a foot, and actually in some other series. If in a series of spoken words there is no such group that makes itself audible, then that series is not rhythmical, or has but a broken and imperfect rhythm, — is ἄρρυθμος or ῥυθμοειδής.

Returning now to our hexameters,

Ἔνδε θεῶν ἀγορὴν ποιήσατο τερπικέραυνος,

Incipe Maenalios mecum, mea tibia, versus,

what times, expressed in speech sounds, here constitute such a smaller group measuring off the whole? If you say that the reader, pronouncing the ancient lines with a modern theory in mind, puts into them something that begs the question, then write the times in musical notes, quarter and eighth notes, and let someone play the series on a pipe organ, on one key, without use of the swell. There can be then no stresses and nothing else to beg the question. Then listen, and ask yourself what is, to the ear, that smaller measuring group. Only one answer is possible. It is the group known as a dactyl, modified in two instances to the rhythmically equivalent spondee. Remember still that we are dealing with actually spoken sounds only, or their musical representatives. When, now, anybody divides the written symbols of that series,

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on paper, so as to produce ⏑–|⏑–|⏑⏑|––|, he has in no way affected the character of the spoken line. The groups he has made are fictitious; they correspond to nothing that can be called a rhythmical fact. He might have divided them on paper in half a dozen other ways; the scholiast to Hephaistion (p. 205 W.) divides a familiar Homeric line so as to make of the syllables, -ἑφη πόδας ὠκὺς Ἀχιλλεύς, the feet, ⏑–|⏑⏑–|⏑⏑–|–; this procedure is perfectly parallel to the one in question. But the line, when naturally spoken, divides itself to the ear in the first way only. The sole real feet there are dactyls and spondees. Marius Vict. appears, in the passage we are now considering, to have understood this perfectly. He gives that division simply to point out the curious numerical combinations, in that such a half-line contains just the right number and kind of syllables to make, if taken in order and in pairs, simulacra of all the disyllabic feet, including the pyrrhic, which Aristoxenos does not recognize. That is an interesting arithmetical fact, but not properly a rhythmical one. The rhythmical facts are those that appeal to the ear, and are what we have seen.

The same principles apply to the related division given in the Pindaric scholia. It does not correspond to the real feet. That is not so obvious when simple dactylic tripodics are alone considered; but when the theory produces the groups –⏑⏑–, ⏑⏑–⏑, ⏑––, and ⏑–⏑⏑, and –⏑––, and –⏑–⏑, and ⏑–⏑–, and asks us to consider these as parallel, and real feet, we cannot but ask, But what then is a foot and what is not? The real problem, in the verse exemplified in say Pindar's third Olympian, is to find what are the smaller groups that made themselves audible to the Greek ear, as measuring off and making intelligible the rhythm, when

those lines were sung. It is impossible to bring into accord with Aristoxenos's conception of feet such heterogeneous groups as those postulated by the scholia to Pindar that Blass makes the basis of his theory.[1] For Pindar's idea of that verse we must look elsewhere.

Nothing is better settled in the history of Greek meters than that Archilochos combined in one *περίοδος* kola of different *γένη*, *ἴσον*, and *διπλάσιον*. Whether he invented this manner, or merely gave general currency in artistic verse to something already familiar in folk-song, need not concern us now. The locus classicus on the subject is Hephaistion 15 (p. 47 ff. W.); the interpretation of this by Rossbach (Metrik,[3] pp. 365–373) is in general convincing, and need not be repeated here. In spite of differences of naming, and some uncertainty as to the point of division between the members, it was recognized down to the latest period that the kola in these cases were distinct and not of the same *γένος*, and that many poets continued and developed farther this practice of Archilochos. The examples most familiar to modern readers are in the epodes of Horace, who follows Archilochos in making each kolon end with a word-ending, though the Greek successors of Archilochos, applying the same principles of metrical combination to other styles of poetry, often made the division between kola divide a word. In one point, however, it is impossible to agree with Rossbach, — in the assumption, namely, that "the dactylic and anapæstic elements pass over from the four-timed to the three-timed measurement" (p. 374). Of this our sources give no hint; we have seen

[1] It is not denied, of course, that there was a meter known as *ἐνόπλιος*, distinguishable from the dactylic hexameter of the *κατ' ἐνόπλιον* type, distinctly named by Xenophon in Anab., VI 1, 11, and perhaps alluded to by Aristophanes, loc. cit.

that the assumption of three-timed dactyls and anapæsts is purely modern. And Rossbach himself adds (p. 379), Freilich ist Taktwechsel nicht ausgeschlossen, apparently admitting thus the lack of evidence for reduction to uniformity. We shall be obliged to return to this point later.

Now, among his examples Hephaistion cites one (p. 52 W.) from Platon *ἐν Ξαντρίαις*:

χαῖρε παλαιογόνων ἀνδρῶν θεατῶν ξύλλογε παντοσόφων.

This he calls *τὸ καλούμενον* Πλατωνικόν, and divides as *τὰ μὲν ἑκατέρωθεν δύο δακτυλικὰ πευθημιμερῆ τὸ δὲ μέσον ἰαμβικόν*. But, as Rossbach points out, a more natural division would be,

$$\_\,\cup\,\cup\,|\,\_\,\cup\,\cup\,|\,\_\,\_\,\|\,\_\,\cup\,\_\,\_\,\|\,\_\,\cup\,\cup\,\_\,\cup\,\cup\,\_.$$

Hephaistion probably preferred the other because that brought the line clearly into the class of *ἀσυνάρτητα*, and enabled him to follow his inclination to make the members catalectic. He then proceeds:

Ἀντεστραμμένον δέ ἐστι τούτῳ τὸ Πινδαρικόν *καλούμενον,*

ὃς καὶ τυπεὶς ἀγνῷ πελέκει τέκετο ξανθὰν Ἀθάναν.
σοφοὶ δὲ καὶ τὸ μηδὲν ἄγαν ἔπος αἴνησαν περισσῶς.

Here, too, it is hardly more than a question of convenience whether we divide as he would have done or in the manner that seems to us more in conformity with the natural *μεγέθη*, namely,

$$\overset{\frown}{\_}\,\cup\,\_\,\overset{\frown}{\_}\,\|\,\_\,\cup\,\cup\,\_\,\cup\,\cup\,\_\,\_\,\|\,\_\,\cup\,\_\,\_.$$

Here we find, then, a clear description of *περίοδοι* containing, in different arrangements, the most common elements of the so-called dactylo-epitritic verse. One of the best of the metrici cites them as compound meters, consisting of dactylic-anapæstic kola and trochaic-iambic

kola. One of the combinations is even known as the Pindarikon; which indicates that this form was closely associated with the poet who is to us the chief representative of this class of meters. Here is a tradition of at least equal value, as tradition, with the one urged by Blass; and while that other harmonizes neither with the teaching of Aristoxenos nor with our sense of rhythm, this harmonizes with both.[1] This treatment also preserves and makes obvious, while the other conceals, the kinship between this particular combination and other combinations of similar elements. The numerous forms described by Rossbach, Metrik[3], pp. 378–390, are of unmistakable character. Why take as our oracle some late anonymous scholiast, and accept from him a method that runs counter to natural affinities, when Hephaistion offers a method so rational and natural? That is a new version of the principle of the difficilior lectio.

By the method of Hephaistion, then, we analyze into kola which are all familiar in endless combinations in other meters of their separate classes. On the one side, in the even class, the prevailing element is the dactylic tripody, either complete or ending on the thesis; dipodies and tetrapodies are mingled sparingly with these. In one particular the dactylic groups retain an older character than the Homeric hexameter, in that each foot but the last of the group is a pure dactyl, while the last is always a spondee, or a simple thesis, which is commonly prolonged. Thus the groups are always clearly separated from each other and from those of the other class. In the iambic class the primary element is the dipody,

[1] Discussing another form (p. 48 f. W.),

⏑ – ⏑⏑ – ⏑⏑ – ⏑ – ⏑ – ⏑ –

Hephaistion mentions with some disapproval the application of the προσῳδιακός theory to the first member.

predominantly of three long syllables and one short. These elements, dactylic and trochaic-spondaic, are combined in various ways into περίοδοι; which exhibit generally a degree of symmetry that corresponds, in rhythm, to what we find in the monuments of the plastic and graphic arts from the same period of Greek life. There is, however, no necessity for entering here into details on this subject, nor for considering the variations introduced, as the prefixed arsis, nor for examining the question of anapæstic and iambic division in such cases, instead of dactylic and trochaic, nor for investigating the question of how far we may assume "eurythmy" and prolonged theses. But the question of time cannot be avoided.

It has already been sufficiently emphasized that there is in ancient tradition no warrant whatever for the three-timed measurement of dactylic or anapæstic verse. The readiness with which that measurement has been accepted is apparently due largely to a mere accident. Modern imitations of such verse, from the character of the languages in which they are written, are almost invariably in triple time, and hence it has been the prevailing practice in schools to read the Greek and Latin originals in the same way. The unconscious effect of that state of things is very great.[1] But the influence needs only to be recognized; it has no place in argument. In the present case the only serious problem remaining is, What was done with the trochaic-iambic element? The possible answers reduce to two classes.

A. There was no equalization of time between the two

[1] We even hear people speak of the impossibility of our reading ancient verse in even time. It has been proved by repeated experiment that there is no serious difficulty in taking an average class and teaching every member of it to read Homer so.

elements. That involves a frequent change of time in passing from one to the other; one trochee or iambus of the usual dipody was rational, the other irrational, precisely as in other iambic or trochaic verse. Sometimes both feet of the dipody are of the normal rational type.

B. The trochaic element was conformed in duration to the dactylic. Here are three possibilities for the trochee or iambus. (1) Westphal's view, that by change of tempo from measure to measure a trochee was made equal in total duration to a dactyl or spondee, and its long twice the length of its short, a third longer than the long of the dactyl. (2) J. H. Schmidt's view (from K. Lehrs and J. H. Voss), that the long of the pure trochee was made thrice the length of its short. (3) That the short was made irrational, the longs being all equal; the effect would be a slight *accelerando* on each pure trochee or iambus.

The argument from Aristides Q. (p. 99 Mb.) in favor of equalization of feet between the two elements[1] is irrefutable so far as this: it compels us to reject any supposition that involves so marked a change, in passing from one element to another, that the listener could say of the rhythm, *βιαίως ἀνθέλκει τὴν ψυχήν, μεταβάλλων ἐξ ἑνὸς εἰς ἕτερον γένος*. For this rhythm in Pindar and the tragedians is clearly of the *ἡσυχαστικὸς τρόπος*. This argument does not, however, exclude the irregularity produced by irrational arses, which appear in other meters of the same *τρόπος*, as in the calmly reflective or deeply religious trochaic and iambic strophes of Aischylos. Nor does it exclude the possibility that a kolon of say two dipodies of pure trochees, occurring amid kola of

[1] Rossbach, Metrik[3], p. 426. This whole section, pp. 425–436, is a model of fair and calm presentation, though certain errors in the premises vitiate the conclusion.

the even class, may have exhibited a complete change to the uneven class, and been rendered in triple time. The practice of combining in one strophe kola of different classes being established beyond question, in Archilochos and many successors and in various styles, what is the natural presumption in such a case as Aisch. Ag., 123 = 144, or 175 f = 183 f? Within the great dactylic strophe, just before the refrain, *αἴλινον αἴλινον εἰπέ, τὸ δ' εὖ νικάτω*, stands the single line *βλαβέντα λοισθίων δρόμων*, and in the antistrophe *στυγεῖ δὲ δεῖπνον αἰετῶν*. The boundless resources of modern harmony, from which chiefly our music derives its richness and variety, were not available; all the more did the ancient musician use to the utmost the available resources of melody and rhythm. The artistic importance of *μῖξις* and *μεταβολή* is repeatedly emphasized in our sources, as in the sentence from Dionysios Hal. quoted above (p. 194). This shift of *γένος* for a simple kolon seems under all the circumstances so natural that only strong positive evidence could justify us in deciding against it. Of such evidence there is none, so far as I know; our mere expectation, derived from modern music,[1] that the same time-signature (*γένος*) should be observed to the end of the movement or strophe, is wholly insufficient. So in the next strophe of the Agamemnon, in the midst of a

[1] Indeed modern music of the highest class makes frequent, and apparently increasing, use of the same freedom. Out of many examples I note two only, both from religious music, of the *ἡσυχαστικὸς τρόπος*. In Rossini's Stabat Mater the words "in amando Christum Deum" (in No. 5) are set in $\frac{6}{8}$ time amid $\frac{4}{4}$ time; in Parker's Hora Novissima a similar change is introduced in the bass aria, "Spe modo vivitur." The second example is a very striking as well as beautiful piece of rhythm. One measure of $\frac{4}{4}$ time is followed by one of $\frac{6}{8}$ time; this pair is four times repeated, and then follows one measure each of $\frac{5}{4}$, $\frac{5}{4}$, and $\frac{7}{4}$ time; next come eight measures again of alternating $\frac{4}{4}$ and $\frac{6}{8}$ time, succeeded by three measures of $\frac{6}{8}$ time.

rhythm otherwise trochaic of the strict type, the kolon next to the last is *πλὴν Διὸς εἰ τὸ μάταν ἀπὸ φροντίδος ἄχθος*; in the antistrophe, *Ζῆνα δέ τις προφρόνως ἐπινίκια κλάζων*. In form this pentapody recalls for a moment the dactylic triad with which the whole choral song began; the refrain of each member was there a dactylic pentapody. As that triad by an occasional trochaic element, becoming more frequent in the epode, looks forward to the movement of the following strophe, so here a single dactylic kolon resumes the earlier movement. The artistic intention seems obvious, the effect a fine bit of what we may call rhythmic harmony; this is obscured and nearly thrown away by the unwarranted assumption of equality of feet throughout the strophe. The shift of *γένος* to that extent, instead of interfering with unity of expression in the *ἡσυχαστικὸς τρόπος*, may even be made to strengthen it, and may contribute much to enhance the power of the whole. This conclusion applies to the strophes of Pindar as well. A dipody of pure trochees may have been rendered in triple time; a dimeter of pure trochees was probably rendered so, though surrounded by dactylic and spondaic elements in even time.

It does not follow, however, that these trochaic measures were treated as Westphal believed, each foot being made equal in total duration to a dactyl or spondee, each syllable a third longer than a syllable of the same sort in the dactyl. That is certainly not the natural and usual procedure in modern music when a change of time-signature occurs. Unless there is a special reason for a distinct change of tempo, and a special indication of this change from the composer, one rather makes the individual notes under each time-signature equal to those of the same name under the other, the measures

thus falling out unequal in total duration. That is what is done with the examples cited above (p. 204, note) and others like them. For kola of the kind we have just been considering, Westphal's assumption is wholly without support. For mixed kola, in which the syllabic form is trochaic-spondaic, that theory postulates a mode of rendering that is for us moderns extraordinarily difficult, — so difficult that we demand the strongest kind of evidence before we can believe it to have been natural to the ancients.

Westphal relied much (Rhythmik[3] p. 289 ff.) on the example of Bach, who wrote one prelude (Well-tempered Clav., II 5, in D major) in an analogous manner. I say analogous, not identical, because in that composition the shift does not occur so often as Westphal's theory requires for the trochaic-spondaic dipody in the dactylo-epitritic, or for logaœdic verse, in which also Westphal assumes the same treatment. In Bach's prelude the shift occurs, it is true, in each measure; but each of Bach's measures corresponds to a kolon of four simple feet in the Greek meter. That offers a much easier problem for the performer than Westphal proposes for the Greek. Yet it is noteworthy that Bach himself, great and original master as he was in musical rhythm, never repeated the experiment; nor has any successor, so far as Westphal could discover, followed the example. Still farther, the difficulty of playing that prelude as the composer wrote it is so great that editors usually print it, as Westphal complains, in an easier rhythm, reducing the measures in common time to $\frac{12}{8}$ time. I do not see then how this experiment of Bach makes at all for Westphal's view.

Nor can we recognize as valid that scholar's version of the principle that the long syllable is always twice the

length of the short, in which he found one main ground for this shift of tempo. To him that principle, applied only to verse that was sung, stood in close relation to his sharp separation of sung from spoken verse. That separation we have found did not exist, and this weakens his case here materially. But still farther, in verse that was sung Westphal recognized fully, as every one must, the triseme and tetraseme that result from catalexis; he recognized also the irrational syllable, though he wrongly assigned to it the exact value of one and one-half the length of an adjacent short. Here surely is a wide breach in the universality of that rule. Accepting these, one can no longer appeal to the rule of two to one as universal. The sentence of Aristoxenos on which chiefly Westphal relied for that rule (Rhythmik[3], p. 286 ff.) he considered to be incomplete, since two proven exceptions are not mentioned there. The fact seems rather to be this: That sentence, which we have only in the Prolambanomena of Psellos, occured in an early part of the treatise, where Aristoxenos was defending his innovation of taking as the measure, not the syllable, but the *χρόνος πρῶτος*. He was emphasizing, therefore, the variability of syllables, and their unsuitableness to serve as a measure. As subordinate to that, his main point, the text admits that syllables have indeed the same ratio of magnitudes, the short syllable being half the length of the long; but the author maintains that this is not enough of constancy to justify the adoption of the syllable as the measure. The text is:

Ἡ δὲ συλλαβὴ χρόνου τινὸς μέτρον οὖσα οὐκ ἠρεμεῖ κατὰ τὸν χρόνον, μεγέθη γὰρ χρόνων οὐκ ἀεὶ τὰ αὐτὰ κατέχουσιν αἱ συλλαβαί,—λόγον μέντοι τὸν αὐτὸν ἀεὶ τῶν μεγεθῶν· ἥμισυ μὲν γὰρ κατέχειν τὴν βραχεῖαν χρόνου διπλάσιον δὲ τὴν μακράν. (Frag. 1 ap. Psell.)

Here is no sign of an incomplete sentence. Yet the exceptions noted are beyond question. At least two explanations are possible besides the one adopted by Westphal. First, Aristoxenos may have thought it sufficient, in a logically subordinate part of a very brief statement, to give merely the well-known general rule, without stopping to mention exceptions which were also well-known, and which later in the treatise he was to explain fully. Or, secondly, the words from λόγον μέντοι on may be not those of Aristoxenos but of his excerptor and commentator, who does not hesitate to mingle his own phraseology with his quotations. These words have no bearing on the point Aristoxenos made; so far as they go they are against it, and sound like the addition of one who would be more exact than his master. But we have too little evidence to settle the question, nor does it really affect our argument. Between catalexis, irrationality, and the χρόνοι τῆς ῥυθμοποιίας ἴδιοι there is abundant room in the system of Aristoxenos for another method of rhythmization in this meter than the one defended by Westphal.

And in fact the proper statement of the real problem is this: How did the Greeks in singing rhythmize these syllabic combinations? The precise ratio of two to one, the common ratio between the long and short, cannot have been strictly observed throughout; the pure trochees (or iambi) must have involved some form of departure from it.[1] Quite apart from the lack of evidence for three-timed dactyls, we must still say that the trochees were somehow rhythmized under the influence

[1] One might be inclined to assume the mode of rendering which is illustrated in the passage cited from Parker's Hora Novissima; but that would be, in ancient terminology, either dochmiac or else (for the most part) feet of the λόγος ἐπίτριτος employed in continuous rhythmopoiia, both of which are definitely excluded.

of the dactyls and spondees, not these under the influence of the trochees. In tragic dialogue, where the foot of two long syllables constitutes distinctly less than half the average line, and never closes it, the obvious preponderance of three-timed feet led the speaker to reduce the time of the apparent spondee, approximating it to the other by making one long irrational. The situation was essentially the same in the trochaic tetrameter, and in other trochaic and iambic meters. But here, in the dipodies which externally resemble those of the tragic trimeter and the trochaic tetrameter, the spondee ordinarily ends the kolon, and often the line and periodos. That fact alone goes far to indicate a spondaic instead of a trochaic movement. And then the proportion of the two classes is reversed, and more than reversed. One must start with a strong prepossession indeed in favor of three-timed rhythms to suppose that one trochee to three or four dactyls and spondees could regulate the whole, reducing all to trochaic time. Assuming, then, that a purely trochaic dimeter, perhaps even a dipody, may have kept its own triple time, we cannot suppose a single trochee, isolated among dactyls and spondees, to have been wholly unaffected by its neighbors. The universal rhythmizing impulse must have made itself felt in some degree on such a trochee. This brings us to the last two possibilities of the above tabulation; was the trochee made ⌞∪ or –>?

A categorical answer seems at present impossible. The evidence appears to me about as follows. To begin with, the foot ⌞∪ is not admitted by Aristoxenos among those capable of continuous rhythmopoiia: *τῶν δὲ ποδῶν καὶ συνεχῆ ῥυθμοποιίαν ἐπιδεχομένων τρία γένη ἐστί, τό τε δακτυλικὸν καὶ τὸ ἰαμβικὸν καὶ τὸ παιωνικόν* (p. 300 Mor.). This is an additional argument against a whole

kolon, or even a dipody, of such feet. But according to frag. 9 from Psellos, single feet of that type mingled with others were admitted by Aristoxenos: *γίνεται δέ ποτε ποὺς ἐν τριπλασίῳ λόγῳ, γίνεται καὶ ἐν ἐπιτρίτῳ.* When, therefore, after telling us (p. 302 Mor.) that the feet *ἐν τετρασήμῳ μεγέθει* are dactylic, Aristoxenos adds, as the reason, that in the number four two ratios are possible, namely 2 : 2 and 1 : 3, *ὧν ὁ μὲν τοῦ τριπλασίου οὐκ ἔνρυθμός ἐστιν*, we must understand him to mean by *οὐκ ἔνρυθμος* not employed continuously. And in fact he is at this point simply enumerating and describing the three *γένη* which he has just said are thus continuously employed. Elsewhere he uses *ἔνρυθμος* in a broader sense; for example, enumerating the differences between feet (p. 298 Mor.), he says that one foot differs from another in *γένος* when their ratios differ, as when one has the ratio of equality, another that of 1 : 2, *ὁ δὲ ἄλλον τινὰ τῶν ἐνρύθμων χρόνων.* The last phrase distinctly implies, as characterizing a foot, more than one *ἔνρυθμος* ratio besides those of equality and of 1 : 2; among these others must be included that of 1 : 3 as well as that of 2 : 3. One illustration of an isolated foot *ἐν τριπλασίῳ λόγῳ* and *ἐν ἐπιτρίτῳ* occurs rather often in lyric iambics. Aisch. Eum. 553 f. reads,

> *ἑκὼν δ' ἀνάγκας ἄτερ δίκαιος ὢν*
> *οὐκ ἄνολβος ἔσται.*

The scheme is ⏑ – ⏑ ⌞ – ⏑ – ⏑ – ⏑ ⌞ ‖ – ⏑ – ⏑ ⌞ – –. Here are three occurrences of the form ⏑ – ⏑ ⌞. To a Greek this was an iambic dipody; but by *ξυνζυγία*—to use the term of the Oxyrhynchos papyrus—the second iambus becomes ⏑ ⌞, *ἐν τριπλασίῳ λόγῳ*, and the whole dipody as a *ξύνθετος ποὺς* is *ἐν ἐπιτρίτῳ*. The names of the feet, as syllabic combinations, were

apparently unchanged; but the χρόνοι τῆς ῥυθμοποιίας ἴδιοι produce these ratios, which are ἔνρυθμοι, but are not employed continuously and cannot occur in immediate succession. This, I say, constitutes one illustration of the foot in the ratio of 1 : 3, and we have no reason for assuming that it was the only one. The single trochee among dactyls and spondees may well have been another. The frequency of such measures in modern music makes this seem to us the more natural answer to our question; in actual reading we more readily answer the question practically in this way than in the other. Analogies in English verse also look that way. The example which I cited sixteen years ago is as good now as then. In Emerson's little poem, The Rhodora, the closing lines are:

> I never thought to ask; I never knew,
> But in my simple ignorance suppose,
> The self-same Power that brought me there
> brought you.

By the preponderance of strong and long syllables the last verse in natural reading passes over from triple to even time. The only syllables that remain strictly short are *the* and *that*; the second of these is made one-third as long as the syllable *Pow'r*, the whole scheme being $\breve{\smile}\,\acute{-}\,\breve{\_}\,\breve{\smile}\,\acute{-}\,\acute{-}\,\acute{-}$. Such feet are by no means rare in English. Browning's Cavalier's song, Give a Rouse, contains several.

But it must be admitted that these considerations taken together do not amount to proof. It is possible the trochee in that situation was made irrational. Indeed I see no reason for excluding the possibility that individual examples may have differed somewhat, according to their phonetic constitution. If the long consisted of

a diphthong followed by two or three consonants, the short being merely a single vowel, such a foot may have taken naturally the form ⏑ –, while another trochee, in which the long consisted of a single long vowel and one consonant, the short consisting of a short vowel plus a mute and liquid, may have taken the form – >. In either case it is not unlikely that the trochee would be felt as στρογγύλος — so far as a single foot could be so — because required by collocation to fill more time than two such syllables ordinarily did fill.

Though Hephaistion gives names for specific combinations in this meter, as Platonikon and Pindarikon, and classes them all under the general name ἐπισύνθετα or compound, we have no ancient term of the precise extent which we include under dactylo-epitritic. That is unfortunate; the name is not only modern but clumsy, and seems to carry with it the false theory in which it originated, that the element – ⏑ – – is really ἐπίτριτος in ratio. Doric is still more inappropriate. We might extend Hephaistion's term Pindaric to this sense; but that would lead to ambiguities. At present, therefore, nothing better than dactylo-epitritic is available, in cases where something more specific than the term compound is required.

The meters that have been generally grouped under the term logaœdic involve so many serious difficulties that no one will look for a complete solution of these here. As to more than one form, after careful examination of the evidence, one may without blushing adopt the confession of T. R(einach), who, in his review of Masqueray's Traité de métrique grecque (Rev. d. Et. gr. 1899, p. 422), speaks of "le glyconien, que M. M. ni moi ne savons scander." My present aim is to indicate the line along which I believe solutions are to be sought,

and to show why they are not to be sought along certain other lines. We will approach the subject by way of the ancient tradition. One principle of method must, however, be emphasized first. It will not do to take one part of the tradition, isolate it from the rest, and build on that as if it were the whole. So stated, the principle is obvious enough; but it has often been disregarded in the treatment of logaœdic verse, as we have seen that it has been disregarded in the treatment of the elegiac and the dactylo-epitritic.

A part of the tradition which at present appears to be in high favor is found in Aristides Q., p. 35 ff. Mb., from which I will quote, translate and summarize, so far as is needful for clear presentation. First the following introductory paragraph:

Τῶν ῥυθμῶν τοίνυν οἱ μέν εἰσι σύνθετοι, οἱ δὲ ἀσύνθετοι, οἱ δὲ μικτοί· σύνθετοι μὲν οἱ ἐκ δύο γενῶν ἢ καὶ πλειόνων συνεστῶτες, ὡς οἱ δωδεκάσημοι, ἀσύνθετοι δὲ οἱ ἑνὶ γένει ποδικῷ χρώμενοι, ὡς οἱ τετράσημοι, μικτοὶ δὲ οἱ ποτὲ μὲν εἰς χρόνους, ποτὲ δὲ εἰς ῥυθμοὺς ἀναλυόμενοι, ὡς οἱ ἑξάσημοι. τῶν δὲ συνθέτων οἱ μέν εἰσι κατὰ συζυγίαν, οἱ δὲ κατὰ περίοδον. κατὰ συζυγίαν μὲν οὖν ἐστι δύο ποδῶν ἁπλῶν καὶ ἀνομοίων σύνθεσις, περίοδος δὲ πλειόνων.

According to Aristides, then, among σύνθετοι ῥυθμοί, made up of feet of two or more γένη, are certain ones known as οἱ δωδεκάσημοι. Also, the σύνθετοι are compounded in two ways, — κατὰ συζυγίαν, combining two simple and unlike feet, and κατὰ περίοδον, combining more than two feet. It is clear that σύνθετοι is here used in a narrower and more special sense than that of the same word in the phraseology of Aristoxenos when he speaks of πόδες σύνθετοι; also that this περίοδος is the later and apparently non-Aristoxenean one. It may

be noted farther that in the next paragraph, on the δακτυλικὸν γένος, the pyrrhic is included, under the name ἁπλοῦς προκελευσματικός, that ἀνάπαιστος ἀπὸ μείζονος is made the equivalent of δάκτυλος, and that the ionic ἀπὸ μείζονος and ἀπ' ἐλάσσονος are also included under the dactylic class and are treated as σύνθετοι κατὰ συζυγίαν, compounded of spondee and pyrrhic. Aristoxenos, however, rules out the pyrrhic and classes the ionic under the διπλάσιον γένος. As regards the six-timed feet this difference of school goes pretty deep, and of itself renders impossible the belief that Aristides is here substantially reproducing Aristoxenos.

The next section is on the ἰαμβικὸν γένος. Here (besides simple iambus and trochee) are mentioned under σύνθετοι κατὰ συζυγίαν two βακχεῖοι: ∪ – | – ∪, of iambus and trochee, and – ∪ | ∪ –, of trochee and iambus. To these are added twelve σύνθετοι κατὰ περίοδον. Aristides' description of these can be most simply given in the following schemes. First come four consisting of one iambus and three trochees, constituted and named as follows:

1. ∪ – | – ∪ | – ∪ | – ∪ τροχαῖος ἀπὸ ἰάμβου,
2. – ∪ | ∪ – | – ∪ | – ∪ τροχαῖος ἀπὸ βακχείου,
3. – ∪ | – ∪ | ∪ – | – ∪ βακχεῖος ἀπὸ τροχαίου,
4. – ∪ | – ∪ | – ∪ | ∪ – ἴαμβος ἐπίτριτος.

Then follow four consisting of one trochee and three iambi:

5. – ∪ | ∪ – | ∪ – | ∪ – ἴαμβος ἀπὸ τροχαίου,
6. ∪ – | – ∪ | ∪ – | ∪ – ἴαμβος ἀπὸ βακχείου ἢ μέσος βακχεῖος,
7. ∪ – | ∪ – | – ∪ | ∪ – βακχεῖος ἀπὸ ἰάμβου,
8. ∪ – | ∪ – | ∪ – | – ∪ τροχαῖος ἐπίτριτος.

The rest have two trochees and two iambi, namely

9.	∪ – | ∪ – | – ∪ | – ∪	ἁπλοῦς βακχεῖος ἀπὸ ἰάμβου,
10.	– ∪ | – ∪ | ∪ – | ∪ –	ἁπλοῦς βακχεῖος ἀπὸ τροχαίου,
11.	– ∪ | ∪ – | ∪ – | – ∪	μέσος ἴαμβος,
12.	∪ – | – ∪ | – ∪ | ∪ –	μέσος τροχαῖος.

As combinations of syllables it is clear that numbers 4, 5, 6, 10, 12, are identical with some of the forms which we know as glyconic; 6 and 10 together, for example, contain the same succession of longs and shorts that we see in the words *τὸν ἀργῆτα Κολωνὸν ἔνθ' ἁ λίγεια μινύρεται*. Accordingly Henri Weil, in the Revue Critique VI (1872), p. 51 ff., accepts this passage of Aristides without reserve as the basis for the true explanation of such verses. His explanation has been widely adopted, as by Masqueray in his recent Traité de métrique, and by Gleditsch in reviewing that book (Berl. Phil. Woch. 1900, Sp. 182 ff.).

But several queries suggest themselves. In the first place, What shall we do with those forms of the glyconic that the scheme of Aristides does not include? For example, that contains no form beginning with two long syllables. Arithmetically the scheme is complete, covering all possible combinations of trochees and iambi, one to three of each kind and four in all; but it makes no provision for an initial spondee, which the majority of glyconics have. In the article cited, Weil does not even allude to this discrepancy; but a sentence on p. 51 seems to imply that he regards the irrational long as solving the difficulty. Yet he insists (p. 52), Conformément à cette tradition nous conservons à toutes les syllabes du mètre glyconique leur valeur naturelle: nous n'y admet-

tons pas de dactyle équivalant à un trochée, ni de longue finale de trois temps. Now Aristides no more allows irrational longs in these δωδεκάσημοι than he does trisemes; one irrational long would make the periodos thirteen-timed for him, as much as a triseme would. For, although in his rhythmical section he describes irrational feet, yet in the metrical section, when actually enumerating the feet and times of specific series, he nowhere takes the irrational syllable into account. For example, in describing iambic verse (p. 53 Mb.) he follows the ordinary "metrical" method, admitting dactyl, anapæst, and spondee, with no hint that these are irrational; and in enumerating the feet (p. 48 f. Mb.) the combination of iambus or trochee plus spondee is called ἐπίτριτος, ἐπεὶ συνέστηκεν ἐκ ποδῶν λόγον ἐχόντων ἐπίτριτον, ὃν ἔχει τέσσαρα πρὸς τρία· ὁ μὲν γὰρ τῶν δισυλλάβων ἐν αὐτῷ τρίσημος ὁ δὲ τετράσημος. In short, wherever he counts up the times of feet in such a way that we can test him, he counts on the "metrical" basis. It is therefore reasonably certain that these twelve-timed periods are so named on that basis, which excludes the irrational syllable. It is clear that the system was in his view complete, and that it does not cover the commonest forms of glyconic verse, but only some of the less common. Is it not a fair conclusion that he was not here trying to describe the glyconic at all? Still less can we suppose him to have intended here to give the key to the countless variety of forms called logaœdic, so few of which are even approximated by his scheme. Take, for example, stanzas like those in Soph. Phil., 169–190. The strophes are of a common type, glyconic lines mingled with nearly related forms; but only one line, νοσεῖ μὲν νόσον ἀγρίαν, is clearly accounted for by this system, which has no place at all either for the antistrophic line

corresponding to the one quoted, or for the lines that immediately follow and are closely akin to these, *ἀλύει δ' ἐπὶ παντί τῳ χρείας ἰσταμένῳ. πῶς ποτε, πῶς δύσμορος ἀντέχει; ὦ παλάμαι θεῶν.* A hypothesis that explains but a small part of the phenomena is seriously defective. Precisely what verse or music Aristides did have in mind here I do not know, nor how far he believed his scheme to be related to concrete examples. The arithmetical completeness of it awakens the suspicion that as a whole it is mainly an arithmetical fancy; yet I would by no means deny that ancient music may have contained all these combinations. But in that case we should surely follow Aristides himself in dividing the series, making each twelve-timed periodos correspond to one modern measure in $\frac{12}{8}$ time. Why does Weil make the line above quoted, *τὸν ἀργῆτα Κολωνὸν ἔνθ' ἁ λίγεια μινύρεται*, consist of one $\frac{12}{8}$ measure preceded by a seven-timed and followed by a five-timed incomplete measure?

For the genuine character and early date of the general theory Weil relies much on the passage of Aristides (p. 98 f. Mb.) on the *ethos* of various rhythms. These *σύνθετοι* are there said to be *παθητικώτεροι* as compared with the *ἁπλοῖ*, – *πολὺ τὸ ταραχῶδες ἐπιφαίνοντες*. Most of all is this true of those *διὰ πλειόνων ἤδη συνεστῶτες ῥυθμῶν· πλείων γὰρ ἐν αὐτοῖς ἡ ἀνωμαλία*. This description is eminently true of the rhythms described. A musical composition in such a rhythm would seem to us, precisely as to Aristides, highly emotional; the recurring syncopations produce an effect of great agitation. But does that agree with the character of logaœdic verse in general, or of glyconic verse in particular? Such a rhythm would in most cases be quite out of harmony with the content. It is a rhythm that would be not inappropriate where the tragedians employ the

dochmiac, — less agitated than that, but approximating it. But Sophokles uses the logaœdic as a meter of all work, varying the form infinitely to suit the content; but in him and all the Greek poets glyconic verses are comparatively equable and calm, — charged with emotion, it is true, as all lyric verse is, but not *πολὺ τὸ ταραχῶδες ἐπιφαίνοντες*.

And then, whether we take Weil's or Masqueray's method of division, we must raise again the question whether that system harmonizes with the Aristoxenean notion of a foot. Masqueray gives the series — — — ∪ | ∪ — ∪ — | — ∪ — ∪ | ∪ — ∪ — |. It is hard to believe that Aristoxenos would have said of these combinations, *τούτοις τοῖς ποσὶ σημαινόμεθα τὸν ῥυθμὸν καὶ γνώριμον ποιοῦμεν τῇ αἰσθήσει*. In our musical system such measures, not occurring too often, are unified by the regular beating of time; occurring in ancient music occasionally, as *χρόνοι τῆς ῥυθμοποιίας ἴδιοι*, they would be unified in the same way, being constantly referred mentally to the *χρόνοι ποδικοί*. But it is incredible that such combinations, in so complicated alternation and succession, were accepted as the regular *χρόνοι ποδικοί* through whole strophes and long poems. It seems to me far more likely that Aristides is here following purely "metrical" theory of the later type, treating series of syllables, long and short, without taking into account the true rhythmical character as actually rendered. We have seen above (p. 190 f.) how Marius Vict. treats one form of the *δυωδεκάσημοι περίοδοι*, — as merely a curious way of dividing a dactylic tripody. He was evidently familiar with the system and may be presumed to have understood it. Yet it is possible — p. 98 f. certainly looks that way — that Aristides is describing real phenomena that were occasionally met with in music, particularly instrumental.

But above all one asks, Are there other ancient descriptions of such verse? Is it true that the theory of Aristides "von sämtlichen griechischen Metrikern geteilt wird," as Weil maintained?

Hephaistion 10 and the scholia thereto (pp. 32–35 and 183–189 W.) constitute an interesting document that contains much in common with Aristides Q. 37, with additions and subtractions. Instead of the *περίοδος δωδεκάσημος* the antispast ⏑ – – ⏑ is now made the key to a variety of meters. The opening paragraph is:

Τὸ ἀντισπαστικὸν τὴν μὲν πρώτην συζυγίαν ἔχει τρεπομένην κατὰ τὸν πρότερον πόδα εἰς τὰ τέσσαρα τοῦ δισυλλάβου σχήματα· τὰς δὲ ἐν μέσῳ, καθαρὰς ἀντισπαστικάς· τὴν δὲ τελευταίαν ὁπότε ἐστὶν ἀκατάληκτον, ἰαμβικήν· ἐὰν δὲ ἀναμίσγηται ταῖς ἰαμβικαῖς, οὐ μόνον τὴν πρώτην συζυγίαν ἔχει τρεπομένην κατὰ τὸν πρότερον πόδα, ἀλλὰ καὶ τὴν ταῖς ἰαμβικαῖς ἑπομένην. ἔστι δὲ ὅτε καὶ λύεται ὁ πρότερος ποὺς εἰς τρίβραχυν.

Then follows a list, with examples, of the noteworthy forms.

1. The *πενθημιμερές*, the so-called dochmiac,
   κλύειν μαίεται. ⏑ – – ⏑ | –
2. The *ἑφθημιμερές*, the so-called pherecratic,
   ἄνδρες πρόσχετε τὸν νοῦν. – – – ⏑ | ⏑ – –
3. The dimeter acatalectic, the so-called glyconic,
   κάπρος ἠνίχ' ὁ μαινόλης, etc. ⏒ ⏑ – ⏑ | ⏑ – ⏑ –
4. Dimeter hypercatalectic, or nine-syllabled sapphic,
   καὶ κνίσσῃ τινὰ θυμήσας. – – – ⏑ | ⏑ – ⏑ – | ⏒
5. Trimeter catalectic, with only the first measure antispastic, the rest iambic,—the *φαλαίκειον*,
   χαῖρ' ὦ χρυσόκερως, βάβακτα, κήλων, etc.
   – – – ⏑ | ⏑ – ⏑ – | ⏑ – ⏑

6. Trimeter acatalectic, or *ἀσκληπιάδειον*,

ἦλθες ἐκ περάτων γᾶς, ἐλαφαντίναν, etc.

– ∪ – ∪ | ∪ – – ∪ | ∪ – ∪ –

7. Twelve-syllabled alcaic, of which the middle foot is antispastic but admits in the first two places any of the four disyllabic feet; this is preceded and followed by an iambic dipody, the former admitting a spondee at the beginning,

κόλπῳ σ' ἐδέξανθ' ἁγναὶ Χάριτες Κρόνῳ.

⏑ – ∪ – | ⏑⏑ – ∪ | ∪ – ∪ –

8. Tetrameter catalectic pure,

κατθνάσκει Κυθέρη' ἁβρὸς, Ἄδωνις· τί κε θεῖμεν.

– – – ∪ | ∪ – – ∪ | ∪ – – ∪ | ∪ – –

9. Tetrameter catalectic but with an iambic dipody in the second place, the *πριάπειον*,

ἠρίστησα μὲν ἰτρίου λεπτοῦ μικρὸν ἀποκλάς.

– – – ∪ | ∪ – ∪ – | ⏑ – – ∪ | ∪ – –

This appears also *πολυσχημάτιστον*; the above is the *καθαρῶς ἐσχηματισμένον*. A frequent form also has only the second syzygy antispastic; Sappho wrote in this meter, as

γλυκεῖα μᾶτερ, οὔ τοι δύναμαι κρέκην τὸν ἱστόν.

∪ – ∪ – | ∪ – – ∪ | ∪ – ∪ – | ∪ – –

10. Tetrameter acatalectic, in which the whole third book of Sappho and many songs of Alkaios were written:

νύμφαις ταῖς Διὸς ἐξ αἰγιόχω φασι τετυγμέναις

– – – ∪ | ∪ – – ∪ | ∪ – – ∪ | ∪ – ∪ –

11. The same hypercatalectic, as used by Simmias,

τὸν στυγνὸν Μελανίππου φόνον αἱ πατροφόνων ἔριθοι.

– – – ∪ | ∪ – – ∪ | ∪ – – ∪ | ∪ – ⏑ – | –

12. Pentameter, used by Alkaios,

Κρονίδα βασιλῆος γένος, Αἶαν, τὸν ἄριστον πέδ' Ἀχιλλέα.

∪∪ – ∪ | ∪ – – ∪ | ∪ – – ∪ | ∪ – – ∪ | ∪ – ∪ –

It is essential to take this entire series together in order to grasp its character and relation to other metrical theories and schemes. Several facts are thereby brought out.

In the first place, the glyconic is here distinctly mentioned by name; an attempt is made to account for its varieties, and to place it in relation to other meters of similar types. Concrete examples appear to be the starting-point, rather than an arithmetical scheme. So far, if we are looking for an explanation of logaœdic verse, Hephaistion is more promising than Aristides. Yet only one of the forms which we know as glyconic is included; this scheme is no more complete than the other. The differences between the two in terminology and method are considerable and lie on the surface; for example, Hephaistion's antispast is one of the two *βακχεῖοι* of Aristides, who enumerates in each case the simple two-syllabled feet instead of taking the four-syllabled foot as the unit. On the other hand, Hephaistion treats the antispast as a compound, *συζυγία*, of which the first half is variable, while Aristides distinctly recognizes the grouping by pairs. In both authors alike we must look in other parts of their work for the treatment of plainly related forms.

If now we ask whether Hephaistion's scheme is in itself rational and satisfactory as an explanation of these metrical forms, the difficulties are considerable, and in part of similar character to those we found in that of Aristides. The fundamental one is in the foot assumed as unit. We need not go over all the discussion about the antispast. The most thorough metricians of the modern school have not yet fully rehabilitated the antispast, though I see no reason why one should stick at it more than at Blass's enhoplii and the other feet assumed

in the Weil–Masqueray theory of logaœdic verse. The objection to all is of the same character. Put simply it is this: We cannot believe that such a combination of syllables was a real foot in the Aristoxenean sense, a foot employed continuously, by which the character of the rhythm was marked and made intelligible. We cannot, indeed, be confident that our rhythmical feeling was in every detail the same as that of the Greeks; we must in some particulars distrust our feeling and accept well accredited ancient doctrine. But we cannot suppose our sense of rhythm to be so absolutely unlike the ancient. So far as the doctrines of Aristoxenos have been handed down to us in unquestionable form, they harmonize well with our experience. His idea of the foot is clearly expressed, is beyond question, and commends itself to our reason. The antispast and amphibrach, as feet of continuous rhythmopoiia, are inconsistent with his description of six-timed and four-timed feet, because in them thesis and arsis cannot stand in due relation to each other; they are out of harmony with other parts of his system, and also with our reason and rhythmic sense, because they divide each pair of short syllables occurring regularly between longs in a continuous series, and put the two syllables in different feet, while our ear agrees with Aristoxenos in refusing to make such a division. And in such shifting and changeable forms as we are asked to accept, in numbers 6 and 7 above for example, all sense of a unit of rhythmic measurement is lost.

Further, does anyone accept the explanation here given of the dochmiac? The right syllables are there, in the right order; but no one supposes that the Greek poets conceived of them as divided in that way. What we have here is a purely "metrical" statement, correct

so far as external "metrical" fact goes, but not correctly representing the rhythm. Precisely how the poets conceived that rhythm one may feel uncertain; we may be quite certain they did not conceive it in this way. But this part of the scheme is of equal authority with the rest, the rest of no greater authority than this.

Finally, Hephaistion's chapter 14, in which are set down *τῆς κατ' ἀντιπάθειαν μίξεως τὰ πυκνότατα*, includes several forms that appear to be related to those we have been considering; they have been grouped naturally with them as "logaœdic." And Hephaistion, though he does not make clear the kinship of the two groups of meters, does apply to them a similar principle. That principle is in essence this: Taking each well-marked and familiar series, treated simply as a succession of long and short syllables in a definite order and number, he divides it into "feet" (*συζυγίαι*) of four syllables each, beginning always at the beginning of the line. As metrical key he then takes that four-syllabled foot which is most nearly constant in the series; the other four-syllabled groups he treats as variations of that foot; if the whole number of syllables is not evenly divisible by four, the line is catalectic or hypercatalectic. Thus, for example, the eleven-syllabled sapphic,

ποικιλόθρον' ἀθάνατ' Ἀφροδίτα, ⏑ – ⏑ ⏒ | – ⏑ ⏑ – | ⏑ – ⏒

is epichoriambic; the first syzygy is a trochaic dipody, "six-timed or seven-timed;" the second is a choriamb; what remains is a "close" (*κατακλείς*) consisting of an iambus and syllaba anceps. The adonic, *πότνια θυμόν*, in like manner is a choriambic penthemimeres. So also the twelve-syllabled line,

ἰόπλοκ', ἄγνα, μελλιχόμειδε Σάπφοι,
⏒ – ⏑ – | ⏒ – ⏑ ⏑ | – ⏑ – ⏒

is an ἐπιωνικὸν τρίμετρον ἀκατάληκτον, because the second syzygy, when the line is divided thus, is an ionic a maiore. That this line is identical with the eleven-syllabled sapphic, except for a prefixed arsis, this way of dividing and naming obscures completely. Yet rhythmically that resemblance is fundamental; a proper rhythmical method would bring this out distinctly. Such a method would involve some recognition of arsis and thesis, and of the Aristoxenean conception of the foot, which this method of Hephaistion ignores.

In short, in all these cases Hephaistion is consistently a metricus. We ought not to expect him to be anything else. He describes the syllabic constitution of these various lines, merely taking the syllables as longs and shorts in the traditional way. His description for that purpose is accurate, concise, complete. It hardly becomes us to throw contempt on his technical method or terminology, until some modern scholar has worked out for the metric of some modern language a system and a terminology equally precise, complete, and terse. But neither should we look in his pages for descriptions of the rhythm where the syllabic constitution does not of itself reveal it to the modern reader. Hephaistion and his readers — or at least his authorities and their readers — read the lines or sung them correctly; they could without difficulty infer the rhythms from the syllabic succession of simple longs and shorts, as we infer the rhythms in English from the succession of accented and unaccented syllables merely. That arrangement of longs and shorts given, they had all they needed, as we for English have all we need when the arrangement of syllables as accented or unaccented is given. They were not writing for a future race who should be unable to do what they did. The error of the present "metrical"

school is natural, but serious; it consists in assuming that a particular ancient "metrical" description is identical, and was meant to be identical, with a rhythmical description. We have in these more complicated meters the same situation substantially that we found in the elegiac pentameter. To ascertain the true rhythm we must follow the same method as with that, though the problem is now more difficult and the solution in some cases less certain. We will, therefore, look a little farther at the ancient tradition in regard to the glyconic, and see first if the "metrical" trail leads to any suggestion as to the rhythm of this and related verses.

In Marius Vict., p. 74 K., the author begins his description of the leading meters which he regards as derived, 'per adiectionem et detractionem, item per immutationem et concinnationem,' from the heroic hexameter. As the starting-point of this system the "kola or kommata" of the hexameter are classed as *ἀρκτικά*, *τελικά*, or *κοινά*, according as they stand, or may by their syllabic constitution stand, respectively at the beginning, at the end, or in both positions, in the hexameter. His Latin equivalents are initiales, finales or novissimales, communes. The system is ingenious and simple, though wholly unhistorical, if regarded as a basis of the explanation of the actual origin and development of meters. As an illustration of the 'trimetrus initialis' he gives 'sic te diva potens Cypri,' and adds, quod metrum glyconium octasyllabum dicitur. Next, as 'trimetrus finalis' he gives 'grato Pyrrha sub antro,' quod pherecration heptasyllabon appellatur'; as 'dimetrus initialis,' 'arma sonantia'; as 'dimetrus novissimalis,' 'terruit urbem.'

As metrical descriptions of the lines quoted these are as authoritative as those of Hephaistion and Aristides. For my part, respect for the treatise that has come to us

under the name of Marius Victorinus has increased steadily with my study of it. Its fulness and clearness raise in the careful reader a high opinion of its author's good sense on the whole, and the numerous repetitions and general eclectic character enable us to trace and to understand much that in other like works is fragmentary, obscure, or wholly wanting. The adonic kolon, 'terruit urbem,' when read merely, cannot have been read without distortion otherwise than as a dactyl and a spondee or trochee. That division is not only "metrical" but indicates the rhythm. For the glyconic this description is not quite so complete as that of Hephaistion. It treats the final syllable, which is anceps, and in this example long, as short; it also takes no account of permissible variations in the first two syllables. But in fact the line is not cited for the purpose of fully describing the glyconic, but only to illustrate the use of terms, which it does with sufficient accuracy. And two points are to be noted. First, the spondaic beginning, which Aristides does not admit among his twelve-timed periodoi, is correctly assumed as a normal form. Secondly, this passage alone is enough to make it impossible to say that the theory of Aristides, as an explanation of the glyconic, "von sämtlichen Metrikern geteilt wird." For though Marius Vict. himself elsewhere (p. 119 K. etc.) offers, as "metrically" equivalent to this division, another division that can perhaps — with the serious exception of the spondee at the beginning — be interpreted into agreement with Aristides, yet this passage distinctly implies a different theory, one surely not original with the author. Farther, it is clear that our author saw nothing in the rhythm of the line that was inconsistent with a division into spondee, dactyl, and a final dactyl with syllable anceps. The following passages throw a little farther light on the matter.

(1) Trimetrum igitur epicum nihil a glyconio metro differre non nulli contendunt, quod constat ex spondeo et choriambo et pyrrichio vel trochaeo ultimo, ex quo plura apud Horatium asmata sunt, ut

sic te diva potens Cypri
. . . . . .

et cetera. nam si solvas choriambum et novissimam eius syllabam supremis duabus adiungas, ex choriambo et dibrachy duo dactyli efficientur. quod cum ita sit, nullus infitias ire poterit, quod ex spondeo et duobus dactylis trimetrum epicum formatum sit. cui si pherecratium adiunxeris heptasyllabum, hexametrum heroum, cui priapeum nomen est, figurabis, ut

sic te diva potens Cypri, grato Pyrra sub antro,

qui constat ex spondeo, duobus dactylis, quarto spondeo, quinto dactylo, sexto spondeo. . . . memineris autem non omnem versum priapeum probabilem fore, nisi eum qui ex glyconio et pherecratio ita est compositus, ut utraque eius cola a spondeo inchoentur, de quo suo loco plenius dicemus. (P. 119 f. K.).

(2) Legimus apud Horatium

sic te diva potens Cypri:

hoc glyconium metrum dicitur, quod constat ex spondeo choriambo et ultimo trochaeo vel eodem spondeo. commune hoc esse cum heroo trimetro, quod constat ex spondeo et duobus dactylis, cunctis in promptu est. item

Maecenas atavis edite regibus

apud eundem lyricum: hoc asclepiadeum metrum appellatur, quod constat ex disyllabis primo et extimo pedibus, mediis duobus choriambis. hoc quoque par et commune

esse pentametro, ei dumtaxat, cui paenultimus anapaestus est, nemo dubitabit. (P. 146 f. K.)

(3) Initium autem ab eo versu sumimus, cui sapphico nomen est, non ut ab ea invento, sed iugiter usurpato: e cuius fonte plurimae species disparis figurae prolabuntur. huius prior forma ea lege taxabitur, qua primus in versu spondeus sollemniter, post dactylus, dehinc tres trochaei ponuntur, e quis ithyphallico seu phalaecio, ut supra diximus, nomen est. instruendi tamen sumus legem collocandi in exordio spondei varie veteres custodisse. nam quidam et trochaeum et iambum in ea sede collocasse reperiuntur, inter quos et Catullus est sub exemplis huius modi,

> cui dono lepidum novum libellum
> arido modo pumice expolitum?
> meas esse aliquid putare nugas. (P. 148 K.)

(4) Nam heroi hexametri tres pedes cum inciderint interposita, ut versus priapeus exigit, distinctione, eundem secernunt, ut 'cui non dictus Hylas puer,' dehinc 'et Latonia Delos.' qui si inter se enuntiatione copulentur, hexametri versus tenorem integrum modumque praestabunt, nequaquam tamen disciplinae ac dignitati heroi respondentem. nam divisio huius in secundo commate infracta paululum ac mollior receptis in versu primo et quarto spondeis efficitur, ut apud Catullum

> hunc lucum tibi dedico consecroque, Priape,

quos distinctio occultat auribus, nam si divisiones metri priapei separentur, ita sonabunt apud Virgilium, 'fronde super viridi sunt,' dehinc 'nobis mitia poma': 'castaneae molles et,' dehinc 'pressi copia lactis.' constat autem, ut supra diximus, duobus metris, quorum prius est glyconium octo syllabarum, sequens pherecratium syllaba

deminutum, ita tamen ut novissima glyconii, id est octava syllaba, longa sit, si natura brevis fuerit, veluti

Nereus ut caneret fera, grato Pyrra sub antro.

igitur quod hoc versu Priapi laudes plerique canendo prosecuti sunt, priapeum metrum nuncuparunt, quod genus hexametri adeo abhorret ab heroi lege, ut utraque pars non numquam trochaeis et iambis aut pro spondeo anapaestis inchoetur aut etiam cretico prius comma pro dactylo terminetur, ut est apud Catullum 'nam te praecipue in suis,' dehinc 'Hellespontia ceteris,' quia bina sunt cola mora distinctionis intercedente. (P. 151 K.)

In (1) the two divisions ——|—⏑⏑|—⏑⏓ and ——|—⏑⏑—|⏑⏓ are shown to be "metrically" equivalent. Next it is shown that a glyconic and pherecratic together, in that order, make a priapeum, provided each part begins with a spondee. The spondee is insisted on because the aim here is to illustrate the derivation theory, which made all three verses developments from the dactylic hexameter. In (2) the asclepiadean is shown in like manner to be identical with the elegiac pentameter, — less the final syllable, as the author makes clear three pages later (150 K.), where he adds a syllable and makes the line, 'Maecenas atavis edite regibus *o*.' Here again, to favor the same derivation theory, that form of asclepiadean is assumed as normal which begins with a spondee and ends with a short syllable. But this likening of the line to the pentameter leads one to raise the question whether in rhythm also, as well as in syllabic constitution, the author understood this asclepiadean to be like the pentameter. We have seen that in the latter, as rhythm, this author, like Quintilian and Augustine, made a pause after the first hemistich, or such a prolongation as filled out the

foot. Did he do the same at the end of 'Maecenas atavis'?

That he assumed such a pause or prolongation in the priapean is distinctly stated in (4). The expressions, 'interposita, ut versus priapeus exigit, distinctione,' — 'bina sunt cola mora distinctionis intercedente,' — 'ita tamen ut novissima glyconii, id est octava syllaba, longa sit' — these, when combined with the quantitative differences allowed between this line and the heroic hexameter, leave no doubt as to what is meant. The case is clearly parallel to that of the pentameter. The two kola are separated always by word-ending and by such a pause or prolongation as makes the adjacent syllables, final of one and initial of the other, both θέσεις, though elsewhere the author did not hesitate to call them a spondee (p. 152, 8 K.). If, in disregard of this law of the 'versus priapeus,' the two kola 'inter se enuntiatione copulentur,' the result will be a sort of bastard hexameter, not the priapeus at all; though "metrically" in some cases the two verses may be identical. And farther, although this alone would not be enough to prove it, we have here a strong indication that the glyconic when it formed a verse by itself also, as read by this author, ended on a thesis, — in other words, that rhythmically, to the metricus himself, the line was — — | — ∪ ∪ | — ∪ | — . In Atilius Fortunatianus however we find it stated plainly (p. 291 K.) that the final syllable was prolonged in the glyconic: Priapeum dactylicum metrum tertium pedem parte orationis finit, producta tamen in ultimo syllaba (nam glyconius versus sic habet). And the rest of the sentence distinctly implies, if we may suppose him to have meant what he said in the word 'aequales', which he emphasizes by position, that the pherecratic also ended with some sort of pro-

longation. For he adds to the above: et in duas aequales dividitur partes. This fits perfectly the rhythm,

$$\overline{\smile}\,\overline{\frown} \mid \frown\smile\smile \mid \frown\smile \mid \llcorner \parallel \frown\,\overline{\frown} \mid \frown\smile\smile \mid \llcorner \mid \llcorner\ .$$

If we are to suppose that the "metrical" descriptions of these verses were also intended to describe truly the rhythm, while each long was understood to have exactly twice the length of a short, such allusions to 'syllabae productae,' to a 'mora distinctionis,' to equality of glyconic and pherecratic, are inexplicable nonsense. But all become at once intelligible, in harmony with Aristoxenos and with our own rhythmical sense, on the supposition which I have followed. One hypothesis leaves a number of insoluble puzzles; the other solves them. In harmony also with this assertion of equality between glyconic and pherecratic is the familiar practice of using the two kola as equal members of a periodos, — as for example in Anakreon's

γουνοῦμαί σ', ἐλαφηβόλε,
ξάνθη παῖ Διὸς, ἀγρίων
δέσποιν' Ἄρτεμι θηρῶν·
. . . . . .
χαίρουσ'· οὐ γὰρ ἀνημέρους
ποιμαίνεις πολιήτας.

In passage (3) the lines of Catullus, obviously nearly akin rhythmically to the second glyconic, are divided on the same principle which Marius Vict. has led us to as the true one, rhythmically, for the glyconic. The same division is given also p. 118 K. "Metrically," there is no inconsistency between the scheme of Hephaistion $\overline{\smile}\,\overline{\frown} \mid \smile\frown\smile\frown$ (above p. 219), and this of Marius Vict., $\overline{\smile}\,\overline{\frown} \mid \frown\smile\smile \mid \frown\smile \mid \frown$; but the latter indicates the rhythm, the former does not.

We have now followed our "metrical" trail far enough to find distinct indications of the true rhythm in cases where the ratio between long and short was other than that of two to one. We have also found, in the metrici themselves, alongside of those unrhythmical divisions that have lately been coming back into favor, not only traces, but precise and full descriptions, of other methods of division applied to some of the "logaœdic" meters, — methods of division which operate only with the feet approved by Aristoxenos, and which harmonize fully with the modern feeling for rhythm. Farther evidence touching the validity of this rhythmical treatment may be found along yet another line of search.

First, what meters did the metrici themselves call logaœdic, and how did they describe these? The loci classici are the following from Hephaistion and Marius Victorinus.

(1) Ἔστι δέ τινα καὶ λογαοιδικὰ καλούμενα δακτυλικά, ἅπερ ἐν μὲν ταῖς ἄλλαις χώραις δακτύλους ἔχει, τελευταίαν δὲ τροχαϊκὴν συζυγίαν· ἔστι δ' αὐτῶν ἐπισημότατα τό τε πρὸς δύο δακτύλοις ἔχον τροχαϊκὴν συζυγίαν, καλούμενον δὲ Ἀλκαϊκὸν δεκασύλλαβον·

καί τις ἐπ' ἐσχατιαῖσιν οἴκεις·

καὶ τὸ πρὸς τρισί, καλούμενον Πραξίλλειον,

ὦ διὰ τῶν θυρίδων καλὸν ἐμβλέποισα,
παρθένε τὰν κεφαλάν, τὰ δ' ἔνερθε νύμφα.

(p. 25 W.)

(2) Ὥσπερ δὲ ἐν τῷ δακτυλικῷ ἦν τι λογαοιδικόν, οὕτω κἀν τοῖς ἀναπαιστικοῖς τὸ εἰς βακχεῖον περαιούμενον· οὗ ἐστὶν ἐπισημότατον τὸ μετὰ τέσσαρας πόδας αὐτὸν ἔχον τὸν βακχεῖον, ὧν ὁ πρῶτος γίνεται καὶ σπονδεῖος καὶ ἴαμβος. καλεῖται μὲν οὖν Ἀρχεβούλειον ἀπὸ Ἀρχε-

βούλου τοῦ Θηβαίου ποιητοῦ χρησαμένου αὐτῷ κατακόρως· γέγραπται δὲ καὶ Καλλιμάχῳ,

Ἀγέτω θεός, οὐ γὰρ ἔχω δίχα τῶδ' ἀείδειν.

τοῦτο μὲν οὖν ἀπὸ ἀναπαίστου· ἀπὸ δὲ σπονδείου,

Νύμφα, σὺ μὲν ἀστερίαν ὑφ' ἅμαξαν ἤδη.

ἀπὸ δὲ ἰάμβου,

Φιλωτέρα ἄρτι γὰρ ἁ Σικελὰ μὲν Ἔννα.

τοὺς δὲ μετὰ τὸν πρῶτον πόδα τρεῖς οἱ μὲν ἐν συνεχείᾳ γράψαντες τὸ μέτρον πάντως ἀναπαίστους ἐφύλαξαν· Ἀλκμὰν δέ που καὶ σπονδείους παραλαμβάνει. (P. 29 f W.)

(3) His logaoedicam metri speciem, quae et enoplios et archebulios dicitur, non absurde coniunxerim, adaeque dactylici metri subolem, scilicet cum trochaica basi versus clauditur duobus vel tribus vel quattuor dactylis praeeuntibus, prout carminis mensura aut ratio exegerit. cuius generis est etiam hoc, quod ex duobus dactylis et duobus conectitur trochaeis et appellatur alcaicum decasyllabum, ut est

laurea Nyctelio corona;

item e tribus dactylis et duobus trochaeis, ut

quadrupedante ciet pede primus aequor;

rursus e quattuor et duobus trochaeis, ut

Romulidæ pedites Arabum populis amici.

quae species et in anapaestico versu reperietur, ita dumtaxat, ut postrema eius clausula bacchio a brevi incipiente terminetur et pro anapaesto non numquam spondeus ponatur. (p. 111 f. K.)

These passages are clear and consistent with one another. Lines or kola beginning with two or more dac-

tyls and ending with a trochaic dipody were called logaœdic dactylic. Correspondingly, an anapæstic beginning and iambic ending constituted the anapæstic logaœdic. But in this latter the first foot may be a spondee or iambus instead of an anapæst, while for some reason the iambic dipody at the end seems always to lack a syllable. The texts call this trisyllabic ending a bacchius; but the examples bear out the scholion (p. 178 W.) which mentions — what we should of course expect — that the final syllable is anceps. That this iambic close should always be catalectic, while the trochaic close of the dactylic logaœdic is complete, catches the attention at once. The two series, it appears, are exactly alike in their ending; the only difference is at the beginning. This is a case where the application of the modern musical method of division brings out most simply the real difference between the two, thus:

– ∪ ∪ | – ∪ ∪ | – ∪ ∪ | – ∪ | – ⏑ dactylic logaœdic,
⏑ ⏑ | – ∪ ∪ | – ∪ ∪ | – ∪ ∪ | – ∪ | – ⏑ anapæstic logaœdic.

That is, a logaœdic series has two or more dactyls followed by a trochaic dipody; it may or may not have a prefixed arsis of one short, one long, or two short syllables. Whether the final syllable was treated as an arsis, or as a thesis following a prolonged syllable, there is here no clear indication; but the name bacchius for the last three syllables of the second form suggests the latter as the true close.

The metrici recognized, therefore, various combinations of dactyls and trochees in one kolon; Alkman admitted the spondee for one or more of the dactyls. The name logaœdic implied at least two dactyls — or in Alkman one spondee and one dactyl? — followed by two

trochees. It is left uncertain whether the nine-syllabled sapphic, in the form *καὶ κνίσσῃ τινὰ θυμήσας* – – – ∪∪ – ∪ – ⏑, which Hephaistion elsewhere (p. 33 W., see above, p. 219) calls an antispastic dimeter hypercatalectic, would also, in the view of Hephaistion, come under this head or not. It would seem that it must; its close kinship, as a piece of rhythm, with – ∪∪ – ∪∪ – ∪ – ⏑, which the metrici certainly called logaœdic, is undeniable. In our longest fragment of Alkman both forms occur as equivalents in antistrophic responsion, as

τῶν ὑποπετριδίων ὀνείρων,
ἄστρον ἀνειρόμεναι μάχονται.
ἀλλ' Ἀγασιχόρα με τηρεῖ.

And at least in these logaœdic verses with two dactyls there is not the slightest warrant in the ancient tradition for syncopation in the modern musical sense, or for any method of rhythmical division other than that into plain dactyls (or spondees) and trochees, perhaps in some cases with a double thesis at the close, the penultimate syllable being prolonged. The form – ∪∪ – ∪∪ – ∪ – ⏑ is simply the familiar *νᾶϊ φορήμεθα σύν μελαίνᾳ*, or 'flumina constiterint acuto,' the fourth line of the alcaic strophe.

Again, no meter has a more plainly marked rhythm, universally agreed upon, than the trochaic tetrameter. But in this trochaic rhythm dactyls were admitted. Hephaistion says:

Τῷ δὲ δακτύλῳ τῷ κατὰ τὰς περιττὰς ἐμπίπτοντι χώρας ἥκιστα οἱ ἰαμβοποιοὶ ἐχρήσαντο ποιηταί· σπανίως δὲ καὶ οἱ τραγικοί, οἱ δὲ κωμικοὶ συνεχῶς, ὥσπερ καὶ ἐν τῷ ἰαμβικῷ, τῷ ἐπὶ τῆς ἀρτίου ἀναπαίστῳ· ἑκάτερον γὰρ ἄλογον· οὔτε γὰρ ἐν τῷ ἰαμβικῷ ἐχρῆν

ἀνάπαιστον ἐπὶ τῆς ἀρτίου χώρας, ἐφ' ἧς οὐδὲ σπονδεῖος ἐγχωρεῖ, οὗ λύσις ἐστὶν ὁ ἀνάπαιστος· οὔτε ἐν τῷ τροχαϊκῷ ἐπὶ τῆς περιττῆς τὸν δάκτυλον, ἐφ' ἧς οὐδὲ σπονδεῖος ἐγχωρεῖ, οὗ ὁμοίως λύσις ὁ δάκτυλος. (P. 21 f. W.)

The rarity of the dactyl among such trochees does not affect our question. It was recognized as legitimate; how was it treated? Evidently Hephaistion considered it parallel to the spondee in the same meter, admissible in the same places, treated in the same way. Rossbach, indeed, says (Metrik[3], p. 189, note): Hephaestion hält den (kyklischen) Dactylus für eine Auflösung des (irrationalen) Spondeus, doch haben beide Füsse nichts mit einander zu thun. The dictum of the last clause rests on nothing but a modern assumption as to the character of the "cyclic" dactyl. We have already traversed that ground, and will not repeat our steps. Hephaistion's view, as here stated, is eminently reasonable, not in conflict with any principle that we have hitherto discovered. In my judgment it furnishes, in combination with the λογαοιδικά, a clue to the right understanding of the meters we are considering. Not that this passing remark of a metrician would alone determine the matter. But other familiar facts point to the same conclusion. In the iambic trimeter also, of the stricter form, two short syllables were admitted in arsis only where the irrational long was admitted. What is there to oppose the natural presumption that the one arsis was equal in duration to the other, both being irrational?

Here, then, are two distinct types of rhythmical combination, which at certain points closely converge. On one side are combinations of two or more dactyls (or in some cases anapæsts, according to the mode of division) followed by a trochaic dipody (or in the other case a

bacchius). Any longer trochaic close than the dipody is for some reason tacitly excluded from the type under this separate name, λογαοιδικά. The reason may be merely a theory that such a longer trochaic series had better be classed as a separate kolon, which would make the whole a compound instead of a mixed meter; or it may be some other feature of the "metrical" system of nomenclature. For our present purpose both the fact of exclusion and the reason for it are immaterial. One or more of the dactyls (or anapæsts, as before) may be replaced by the spondee; one pure dactyl was enough to preserve the general type. So much on the one side. On the other side is the single dactyl occuring in one of the odd places of trochaic verse, or (as before) the anapæst in iambic verse; in both alike two short syllables fill the place and the time of an irrational long. In tetrapodies the two types approximate each other closely; for example,

ἀλλ' Ἀγησιχόρα με τηρεῖ. — — | — ∪ ∪ | — ∪ | — ×
τοῖς Ἐλευσινίοις φυλάσσων. — ∪ | — ∪ ∪ | — ∪ | — ×

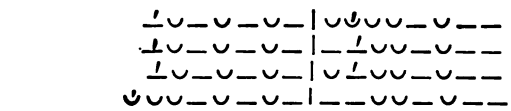
The latter is cited from a trochaic tetrameter of Epicharmos. Both these forms are divided by the old metrici in the manner indicated; one cannot doubt that in these cases that division indicates correctly the rhythm.

How, then, should we divide in order to indicate the rhythm in other lines that are clearly, so far as we can see, of nearly related character? Alkman furnishes illustrations enough. Let one examine without a preconceived view these passages.

(1) Εὕδουσιν δ' ὀρέων κορυφαί τε καὶ φάραγγες,
πρώονές τε καὶ χαράδραι,
φῦλά θ' ἕρπετα τόσσα τρέφει μέλαινα γαῖα.

(2) Ἦ οὐχ ὁρῇς; ὁ μὲν κέλης
Ἐνετικός· ἁ δὲ χαίτα
τᾶς ἐμᾶς ἀνεψιᾶς
Ἀγησιχόρας ἐπανθεῖ
χρυσὸς ὡς ἀκήρατος·
τό τ' ἀργύριον πρόσωπον —
διαφάδαν τί τοι λέγω;
Ἀγησιχόρα μὲν αὔτα.

In (1) the subject excludes all thought of any rhythm that could express τὸ ταραχῶδες; syncopation is out of the question. The first line is λογαοιδικός, except that one more trochee is added. Can anyone believe that the additional trochee alters in any way the rhythmical character of what precedes? The line is surely ——|—∪∪|—∪∪|—∪|—∪|—∪ The only question that can arise with regard to divisions is whether Alkman conceived of it as one kolon or two. But the third line is identical in movement, except that the second syllable is short. This is not antistrophic responsion, it is true; but it is just the kind of repetition with slight variation that is so prominent a feature in all the rhythmic arts, and is founded deep in the very nature of those arts. The line between these two consists of four pure trochees; sense-pauses fall at the end of each line. It is impossible to divide the third line otherwise than as —∪|—∪∪|—∪∪|—∪|—∪|—∪ . But here we have one trochee before and three after the two dactyls. Again, in (2) the first four lines are repeated rhythmically in the second four with two slight variations. For convenience of comparison with the trochaic tetrameter we may write the scheme, simply longs and shorts, ignoring for the moment the question of prolongation, thus:



The movement is plainly trochaic; but for the tribrach in the first line of the scheme a dactyl appears in the other three. Here, then, is the single dactyl again among trochees, in such surroundings that one cannot doubt that at least the second of the two shorts belonged in arsis, not in thesis. As to the first of the two shorts, one might indeed make an argument for putting it in thesis. So far as this passage alone goes, one might take the correspondence between the dactyls and the tribrach as a bit of evidence for making the long irrational and regarding the thesis as made up of this irrational long plus the first short. But we have seen that the evidence for a cyclic dactyl of the same duration as a trochee, — a dactyl in which the syllables bear the ratios of $1\frac{1}{2} : \frac{1}{2} : 1$ or of $\frac{2}{4} : \frac{3}{4} : \frac{3}{4}$ — dissolves and vanishes before critical examination. Also the evidence for any form of irrational syllable, properly so called, in thesis, turns out very dubious at best. Farther, the verses in question, 4, 6, 8 of the text, if divided separately in Hephaistion's fashion, come under the head of Hephaistion's *ἀναπαιστικὰ λογαοιδικά* — unless indeed we are to insist that two pure anapæsts must be present in addition to the initial spondee or iambus, to justify that name. In short, there is no sufficient reason for doubting that the dactyls we are considering are of exactly the same character as those in (1).

Thus by several roads and from rather distant starting-points we have arrived at the same result, namely, the existence in Greek poetry of numerous and common forms of mixed kola, — that is, of kola wherein one or

more dactyls are combined with one or more trochees or iambi. The old metricians themselves recognized such mixture within a kolon, though it was no part of their program to explain fully what in such cases the real rhythm was. To call such mixed kola logaœdic is to extend a little, but only a little, the sense of the ancient term; if one does not like to do that, the simple term mixed, which is also ancient, will do very well.

How did the rhythmizing impulse deal with such mixed kola? Somewhat variously, we may believe, but variously within narrow limits, according to the nature of the material, — that is, according to the proportion of the two kinds of feet, and according to the phonetic constitution of the separate feet. To simplify the problem we will consider only the cases where there is no question of prolonging a thesis to a triseme or a tetraseme — in other words, kola of dactyls and trochees alone. Following the indications of the rhythmici and metrici together, and accepting hints from our own procedure in rhythmizing modern verses, in reading them and in singing them to the simplest melodies, we may state the matter thus. Two impulses acted in a certain degree of opposition to each other. One impulse was to rhythmize the syllables of dactyls and spondees in even time, thesis and arsis equal, and the syllables of trochees in triple time, thesis twice the length of the arsis. That was the normal thing; it was founded in the nature of language as ordinarily spoken, and in the nature of the rhythmic sense. The constancy of that impulse produced in Greek poetry in general the two rhythmical classes distinctly felt as the γένος ἴσον and the γένος διπλάσιον. The other impulse was to carry the equalizing process through the entire kolon by making the feet themselves equal. That is, of course, only another mani-

festation of the same tendency that produced the former impulse. Both result from the inclination to arrange our rapid muscular movements, and the sounds which they produce, in groups of equal duration, or in groups whose relative durations exhibit very simple ratios. But one impulse deals with the smallest rhythmical unit, the syllable, and arranges successive syllables in the familiar grouping, the feet. The other deals with the larger and more complex unit, the foot, the product of the first impulse, which is the primary and the stronger impulse of the two. The impulse to equalize feet of different *γένη* is secondary. The process is not so easy, because it involves some violence to the primary impulse; equalization is not so imperatively demanded; the habit of shifting at brief intervals from one *γένος* to another is constantly exercised in daily speech. Accordingly in a line like *εὕδουσιν δ' ὀρέων κορυφαί τε καὶ φάραγγες* we may suppose the movement to have been distinctly that of even time through the first three feet, then of triple time the rest of the way. The line may indeed have been conceived as consisting of two kola; three dactyls constituted a kolon in most forms of the dactylic verse. The *accelerando* of the latter part of the line produces a pleasing effect that has parallels in English verse. The conductor in such cases would simply mark the thesis, giving one down beat to each foot; that would be ample guidance for any chorus. In shorter lines like

γουνοῦμαί σ', ἐλαφηβόλε,
ξανθὴ παῖ Διὸς, ἀγρίων
δέσποιν' Ἄρτεμι θηρῶν,

the effect must have been the same, though the *accelerando* and *ritardando* recur at briefer intervals. On the other hand, if a single dactyl occurred amid trochees (or

a single anapæst amid iambi) the general movement in triple time was so distinctly marked that the single foot would doubtless be so far shortened as to become clearly irrational. That is essentially the same situation that is so frequent in iambic and trochaic verse, when a "spondee" stands in one or more of the dipodies. In all such cases the arsis of the isolated foot, which was normally in other surroundings made equal to the thesis, was now made irrational; the iambic movement was retarded by a slight delay on one up-beat. Between these two extremes were the numerous cases that form, taken together, an unbroken and minutely graded sequence. Every grade can be illustrated from our fragments of the lyric poets, and a great variety of forms might appear in a single poem.

This theory throws overboard the doctrine of equality between the feet. Yes; but no more completely than Aristoxenos does by his doctrine — unquestionably sound — of the irrational syllable. And we may add, no more completely than does modern music when simple words of emotional character are sung with expression. An irrational trochee was longer than the pure trochee beside it, — just as much longer as a dactyl among trochees, and no more so. The irrational syllable was not exactly measured by the χρόνος πρῶτος, which is, nevertheless, properly called the measure of the rhythm in general. The doctrine of the χρόνοι τῆς ῥυθμοποιίας ἴδιοι must also be remembered as part of the system of Aristoxenos. And yet this does not mean the reintroduction of chaos into metric. Limits were strictly drawn beyond which poet or singer could not go and did not desire to go — as distinctly as with the modern poet and modern singer. In such mixed kola unity was maintained by equality between theses; arses might vary

between the limits fixed for irrational syllables, that is, between the length of a thesis and that of half a thesis. If more than one foot of the dactylic class was admitted, they were grouped together; a prolonged thesis, or *μονόχρονον*, might stand between them, but no true foot of the iambic class. There is also a strong tendency, though it is by no means a fixed rule, to place the feet of even time at the beginning of the kolon and make the close in triple time. In the second glyconic the noticeable preference for a spondee in the first place is a manifestation of the same natural rhythmic feeling. In such ways the sense for rhythmic law controlled the poet and musician, and should control the modern student. Indeed, in all the arts that deal with time or with space mathematical relations are the framework; the flesh that clothes and gives life to the skeleton, making the whole a work of art instead of a mechanism, must in doing this round out the surface and lend grace to the hard mathematical lines. Without the rigid framework to determine the essential character and fix the significant relations, the whole would be unmeaning, a formless confusion; though any skeleton performs its function best when well covered. To take another illustration, already used above (which of course must not be pressed too far), the rhythmic effect of such departure, strictly limited, from exact ratios between arsis and thesis may be compared to the harmonic effect of discords in music, which are at once resolved, and lend expressiveness and force as nothing else could. None of these departures went farther than modern *tempo rubato*.

One source of difficulty in melic meters must always remain, in lack of the music. Though the musician did not do violence to natural quantities — that is, did not so rhythmize as to shorten or prolong individual sylla-

bles much beyond the limits allowed in speaking — yet he might, and sometimes did, adopt for a particular series such a combination of the syllabic times as would not have suggested itself to a reader. In such cases the composer indicated the times in his notes. The Seikilos inscription (C. Jan, Musici Scriptores, p. 452, or Suppl., p. 38 f.) is an example of such rhythmization; no modern reader certainly, and probably no ancient reader, could, without the notes, have discovered the rhythm there adopted. How far the lyric and dramatic poets availed themselves of this freedom we have no means of knowing, and no papyri or inscriptions are likely ever to answer the question fully. No student of metric should leave this uncertainty out of view. The foregoing interpretations are offered with distinct recognition of this uncertain element, but with the conviction that at present we have no sufficient ground for believing that that element was after all very large in the meters we have been considering.

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INDEX.

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INDEX.

NOTE. — Full-faced figures indicate that the original is quoted.

ADONIC, 223, 226.

Aischylos, parodos of Ag., 204 f.; Eum. 516–519, 195; Eum. 553 f., 210; Pers. 66–116, 166.

Alcaic, 220.

Alkman, 190, 234 f., 237 ff.

Ἀλογία (see also *Irrational*), defined by Aristoxenos, **109** f., Westphal's view, 111 f.; in English verse, 112 f.; associated with theory of various longs, 9; but not by Aristoxenos, 11 f.; not in thesis, 173 f.

Ambiguous meters, 39 f.

Amphibrach, 222.

Anakreon, 231.

Antispast, 219, 221 f.

Archilochos, 58; combined two γένη in one περίοδος, 199.

Aristides Quintilianus, on quantity of consonants, **8**; on συμπλέκοντες etc., **9**; characterized, 10 f., 191; on order of topics in metric, **15**; on elegiac pentameter, **31**; on μέσα μέτρα, **39** f.; on ῥυθμός and πλάσμα, **51**; cites rhythm of pulse, 65; notes behavior of voice in reading poetry, **129**; on extent of kola, **145**; on σημεῖα τοδικά, **146** f.; on irrational feet, **151**; defines foot, **154**; on στρογγύλοι and περίπλεφ, **176** ff.; on περίοδος, 191 f.; on effect of frequent change of γένος, **203**; on σύνθετοι ῥυθμοί, **213** ff.; counts "times" on "metrical" basis, 216; differences between him and Aristoxenos, 213 f.; between him and Hephaistion, 221; on *ethos* of rhythms, 217.

Aristophanes, Clouds 649 ff., **185**, 188, 18 f.

Aristotle, refers to μετρικοί for doctrine of sounds and syllables, **16** f.; counts rhythm and imitation equally κατὰ φύσιν, **65**; on rhythm of prose, **90**.

Aristoxenos, founder of rhythmical school, 11; made metric a branch of rhythmic, 14; his Elements of Rhythm extant in fragments, 15; made χρόνος πρῶτος instead of syllable the unit in rhythm, 15, 25; took from earlier authorities his description of sounds, 16; put traditional metric in new light, 18; pupil of Aristotle, 25; why his system was not universally adopted, 25–27; on the foot, **37**; our safest guide on rhythm, **54**, **57**; defines rhythm, **58**; cited rhythms from nature and from human life, **66**; on process of rhythmization, **101** ff.; on χρόνοι τοδικοί and ῥυθμοποιία, 104–109; on ἀλογία, **110**; on motion and rest in rhythm, **116**; on movement of voice in speaking and in singing, **121** f.; notes effect of emotion on speech-tune, **129**; his definition of foot, **131** f.; allows no two-timed foot, **135**; on σημεῖα τοδικά, **138** ff.; on means of dividing time in rhythm, **147**; on arsis and thesis, **150**; irrational syllable always in arsis, 173 f.; his statement that a long has twice the length of a short, **207** f.; on λόγος τριπλάσιος and λόγος ἐπίτριτος, **209** f.

Arnold, M., 164 note.
Arsis and thesis, 150; importance of, 151 f.
Ars Palaemonis, on metrum and rhythmus, 52 f.
Asclepiadean, 220, 227 ff.
Atilius Fortunatianus, on rhythmus and metrum, 44; on the priapean and glyconic, 230 f.

Bacchylides papyrus, 195.
Bach, J. S., 206.
Barnby, J., 80.
"Bean porridge hot," 73 ff.
Bennett, C. E., 32, 156 ff.
Blass, F., his theory of enhoplii, 184 ff.
Baccheios, on ῥυθμός and μέτρον, 42; on the ἐνόπλιος, 186.
Browning, R., 91, 211.
Bücher, K., Arbeit u. Rhythmus, 67–72.

Caesar, J., 15, 181, 191 note.
Caesius Bassus, 164 f.
Catalexis, modern illustrations, 22 f.
Catullus, 164, 166 note, 228.
Change of γένος within a strophe, 204 and note.
Choriambic, 223.
Christ, W., 3, 36, 155 f., 192 note.
χρόνοι ποδικοί, 104 ff., 134 ff.
χρόνοι τῆς ῥυθμοποιίας ἴδιοι, 104 ff., 153.
Consonants, their quantity, 8 f., 13, 87.
Counting-out rimes, 73.
"Cyclic" anapaests and dactyls, 168–183.

Dactylo-epitritic verse, 184 ff.; name, 212.
Dactyls, lyric, 190.
Darwin, C., 128 f.
Diomedes, on dividing the pentameter, 38.
Dionysios of Halikarnassos, on various longs and shorts, 7 f.; his metrical analysis of clauses from Thukydides, 41 f.; lists of feet show Aristoxenean influence, 43; contrasts prose and ῥυθμός, 51; on rhythm, etc., in oratory, 126; on melody of speech and of song, 127; distinguishes εὔρυθμος and ἄρρυθμος, 127; 130, 168; on "cyclic" feet, 168 ff.; on περίοδος, 194.
Dipodic grouping, 145, 161.
Dochmiac, 219, 222 f.
δωδεκάσημοι περίοδοι, 190 f., 213, 216.

Emerson, R. W., 211.
English verse, described differently by people who agree in their reading, 25; misunderstood, acc. to Tennyson, 25 note; Lanier's "Science of," 83 note; Goodell's "Quantity in," 83 note; in what sense based on word-accent, 95 f.; irrational syllables in, 112 f.; its rhythm not yet adequately examined, 134; ambiguities in rhythm, 160; admits conflict between stressed accent and verse ictus, 163 f.; why its rhythm is not recognized, 182 f.
Enhoplii, Blass's doctrine of, 184 ff.
Epichoriambic, 223.
Equality between feet, 242.
"Eurhythmy," 202.
Excerpta Neapol. on ῥυθμός, 43.

Foot, more than one syllable necessary for, 87; feet in ratio 1 : 3 and 3 : 4, 209 ff.

Gleditsch, H., 3, 125, 155 f., 215.
Glyconic, 212, 215, 219, 221, 225 ff.
Goethe's Heidenröslein, in Schubert's music, 22; in Reichardt's, 23.
Goodell, T. D., 83 note.
Gramophone records, 75, 87, 88.

HENDRICKSON, G. L., 32, 159 ff.
Hephaistion, does not treat of the letters, 16; on elegiac pentameter, 30; assumes different *γένη* in one *περίοδος*, 200; on antispastic meters, 219 ff.; on other related meters, 223 f.; his principle of analysis, 223; on *λογαοιδικά*, 232 f.; on dactyls among trochees, 235 f.
Holmes, O. W., 94.
Horace, 165, 199.

Ictus, 156 ff.
Irrational feet, 150 f. (See *Ἀλογία*.)

JAN, C. v., 43.

KAWCZYNSKI, M., 15, 53, 156.
Keats, J., 164 note.
Kola, their extent, 144 ff.

LA FAGE, J., 29 note.
Lanier, S., 83 note.
Letters, description of sounds of as part of metric, 15 ff.
Lindsay, W. M., 167 note.
Liszt, F., 133.
Logaœdic meters, 212–244.
Longinos, makes all longs equal, all shorts equal, 16; on *ῥυθμός* and *μέτρον*, 44; cites rhythms from animal and human life, 65.
Lowell, J. R., on composition of "Commemoration Ode," 94.

MALLUS THEODORUS, on "metra" and "rhythmi," 45.
Marius Victorinus, on metrici and musici, 6 f.; follows traditional order of topics, 16; on elegiac pentameter, 30 f.; his way of naming feet and of counting times, 41; on rhythmus and metrum, 44, 46, 48, 49 f.; on *σημεῖον*, 149; defines foot, 154; on heroic and dactylic verse, 185 f., 189 ff.; on *περίοδος δωδεκάσημος*, 190 ff., 218; on glyconic etc., 225 f., 227 ff.; on *λογαοιδικά*, 233 f.
Mason, Wm., 133.
Masqueray, P., 212, 215, 218.
Mathematician, unconscious automatic, 29, 76.
Metrici, our proper attitude toward, 27 ff. 42, 53 ff., 224.
μέτρον, earlier name for foot, 132.
"Metrum" in contrast with "rhythmus," 42–53.
Middle spondee, in pentameter, 32–42.
Modulatio, see *πλάσμα*.
μονόχρονον, 136, 194, 195.
Musician, ancient, needed no detailed theory of rhythm, 20 f.; modern, analyzes and writes rhythm of verse, 81.

OXYRHYNCHOS papyrus, 108 note, 136 f. 187, 194 f., 210.

PARKER, H. W., 204 note, 208 note.
Parœmiac, 152 f.
Pentameter, elegiac, name old, 15, 32; name natural, 37 f.; described by Hephaistion, 30; described by Marius Vict., 30 f., 35 f.; by Aristides Q., 31; by Terentianus Maur., 35; by Augustine, 36; acc. to Quintilian, 32 ff.; strange scanning, 35, 38; perhaps read, later, with true middle spondee, 39–42.
περίοδος, two senses, 191 ff.; containing kola of different *γένη*, 199 ff.; 213.
περίπλεφ, 176 ff.
φαλαίκειον, 219.
Pherecratic, 219, 225 ff.
Pindar, Nem. IX 1, 185.
Πινδαρικόν, 200 f.
πλάσμα, 50, 51, 77, 79, 81 f., 129.
Plato, refers to *μετρικοί* for doctrine of sounds and syllables, 17; on

rhythm, 65; on *ἐνόπλιος*, 185, 189.
Πλατωνικόν, 200.
Priapean, 220, 227 ff.
Probus, 51.
Prose, its rhythm, 89 f.; why later than poetry, 92; and verse, 115 ff.
Psychological Laboratory, Yale, 63 note, 85 note.

"Quantity in Eng. verse," 83 note.
Quintilian, on elegiac pentameter, 32 ff.; on "rhythmi" and "metra," 49.

Raff, J. J., 133.
Reinach, T., 212.
Rhythm, definitions, 58 f.; how related to symmetry, 59 ff.; need of repetition in, 60; *τάξις* essential, 61 f.; rhythm in nature, 62 f.; inborn in all men, 64; remarks thereon by Aristotle, Plato, Aristides Q., Longinos, 65; various examples, 65 f.; Bücher's study of rhythm in work, 67–72; relation of words to rhythm in work-song, 69–72; rhythm in children's play, 72–76; of modern verse analyzed and written by musicians, 22 f., 81; of nursery rimes, 81; of Eng. poetry in general, 82–86; in Eng. speech, 86–96; in Greek, 96–98, and chap. iv; practice requisite for analysis of, 84–86; mechanical analysis of, 84 f.; relation to pitch ratios, 84; Scripture's experiments, 85 note; of prose, 89 f.; proper starting-point for study of, 92 f.; artistic production of, 93–96; production of in Greek, 98; how far based on word-accent in English, 96; rest and motion in, 116–120, 124; in oratory, 126; dochmiac, 132 ff.
Rhythmization, a shaping process, 100 ff.
Rhythmizing impulse, 21; how it deals with English, 86 ff.; how it dealt with Greek, 96 ff.; how it dealt with mixed kola, 240 ff.
Rhythmizomenon, significance of, 100 f.
Rhythmopoiia, 104–109.
"Rhythmus" in contrast with "metrum," 42–53.
Ribot, T., 94.
Rossbach, A., 3, 190 note, 195, 199, 200, 201, 203 note, 236.
Rossini, G., 204 note.

Sapphic, nine-syllabled, 219; eleven-syllabled, 223, 228.
Schmidt, J. H., 195, 203.
Scholia, to Hephaiston, on metrici and rhythmici, 6; on *ἐνόπλιος*, 185, 188 f.; on *περίοδος*, 193; on division of the hexameter, 198.
Scholia to Pindar, on *προσοδιακά*, 184, 196, 199.
Schroeder, O., 196 and note.
Schubert, F., 22.
Schultz, G., 15, 32 ff., 156.
"Science of Eng. Verse," S. Lanier's, 83 note.
Scripture, E. W., 85 note, 87.
Seikilos epitaph, 149, 244.
σημασία, 135, 156 ff.
σημεῖον, *σημεῖα*, 104 f., 134, 138 ff.
Shelley, P. B., 164 note.
Song, Greek, employed other time-ratios than 2 : 1, 19; modern, adopting rhythm of spoken words, 21 ff., 76 ff., 78 f., 80; popular Hungarian, with shifting time, 133.
Sophokles, O. T. 483–512, 166; El. 130 ff., 190; Phil. 169–190, 216 f.; his use of logaœdic, 218.
Speech-tune, 121 ff.; passes into true melody, 128.
Stolz, F., 167 note.
Stress, in English and German, 96; in ancient Greek, 97, 158 ff.; in ancient and modern theory, 155

ff.; element in Latin word-accent, 162 ff.; does not always coincide with ictus in English, 163, 166.
στρογγύλος, 176 ff., 212.
Suidas, 194.
σύνθετοι πόδες, 210.
Susemihl, F., 15.
Sweet, H., 87.
Syllables, natural starting-point for metrical theory, 21, 27 ff.; mark smallest rhythmic times noted, 87 f.; their elasticity, 100, 112; common, long, short, 113–115.
Symmetry, how related to rhythm, 59 ff.; in rhythmical composition, 202.

Tennyson, A., on English meter, 25 note, 96; 160; 164 note.
Terentianus Maur., on elegiac pentameter, 35; 187, 190 note.
Theory of rhythm, not needed by Greek reader or singer, 14; nor by poet, 20–25.
Thrasymachos of Chalkedon, 194.
Time, changing in modern music, 133, 204 note.
τονή, 80.
Tralles inscription, 149, 244.
Triseme, 136.

Varro, definition of versus, 114.
Verse and prose, 115 ff.
Voice, in speaking and in singing, 21, 29, 115 ff., 120 ff., 129.

Weil, H., on movement of voice, 124; on glyconic, 215 ff.
Westphal, R., 3, 54, 194, 203; his doctrine criticised, 103, 111 f. 115, 123–125, 140, 144 f., 155, 170 ff., 177 f., 205 ff.
Word-accent, in Eng. rhythm, 71, 75, 96, 163 f., 166; in Latin, contained stress as one element, 162 f.; in Greek, disregarded in singing, 168.
Work-song, 68–72.
ξυνζυγία, 194, 195, 210.
ξύνθετοι, see σύνθετοι and Aristides.

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